The Builder.

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A Budget of Books and Papers.

DURING the last few weeks, books, pamphlets, and journals, have accumulated; for truly, as *the* Book says, "of making many books there is no end." He who mastered them all might be disposed to add, completing the quotation, "And much study is a weariness of the flesh." Leaving some of the heavier and more important,—such, for example, as "Reynolds and his Times," and Mr. Murray's interesting "New Testament illustrated,"—for early special notice, we must make a dash at the heap, and endeavour to bring the contents of some of them to the knowledge of our readers.*

First comes to hand "A Proposal for diminishing Crime, Misery, and Poverty, in Liverpool," by M. J. Whitty. The condition of Liverpool has been for some time forcing itself on the minds of its more thoughtful citizens. Foremost amongst these is Mr. M. J. Whitty, who, in connexion with the *Daily Post*, and in his burghal position, has long sought to make this condition known, and to obtain remedies. Under the title we have given, he prints three letters, one describing "A street in a dark district;" the second asking, "Why are streets the abode of vice, crime, and misery?" and the third offering a "Remedy." Public opinion and the public eye, says he, are the two most potent powers in the world. On the denizens of these streets these powers have no bearing. Bring them to bear, that is my remedy. "My plan is the ancient one in principle—responsibility of neighbour for neighbour." What he proposes is, that the densely populated and the less opulent parts of the town be divided into districts, and that each district shall be presided over by a "local committee of safety," the members of these committees to be elected by the householders, ten householders electing one member from among themselves. Ten electors, he thinks, will be numerous enough, because small streets should have at least one representative, and large streets more than one. A district should not be too large, and for this reason, a committee should belong to the district, in order that members should know the inhabitants and be known to them. The proposed "local committee of safety" should present themselves as Government officials; and, in order that they may do this, it will be absolutely essential that they proceed under the sanction of an Act of Parliament. The Act must of course be general, and, being a Government measure, will cost nothing. When properly appointed, what are the committees to do? By virtue of their office they will have authority to get information, to remonstrate, to advise, to hear complaints. Like the medical officer and the sanitary officers of the Corporation, they may enter any house without being charged with trespass, and, being sworn in as constables, they may demand the assistance of the force and give aid to the force when required. Their business, however, will be mainly to counsel and reprimand; to be kind even when they address the worst offenders, and, when counsel and remonstrance fail, to appeal to those whose especial duty it is to put the law, criminal or repressive, in force. "Warning must precede action, and the act will be the communication of facts to Major Greig, the health committee, the watch committee, the select vestry, Mr. Raffles, and the mayor."

Would such an organisation effect great good? We have not the least doubt about it. It is to be feared, however, that there are sufficient difficulties in the way to render it unlikely that it will be brought about. Even an approach to it would be advantageous: the appointment of district committees without the authority of an Act of Parliament.——While Liverpool has its Whitty, Trench, and others, Salisbury is all the better for Mr. Middleton, who puts forth, in the shape of a pamphlet entitled "The Benefits of Sanitary Reform, as shown by Salisbury, in nine years' experience thereof," the paper he read at Bath. Salisbury must date its movement towards improvement from the last visitation of cholera there. It had long been noted as unhealthy. In that wonderful book, the "Anatomy of Melancholy," there is an allusion to Salisbury quoted by Mr. Middleton. Burton there writes, "The worst is a thick, cloudy, misty, foggy air, such as comes from fens, moorish grounds, lakes, muck-hills, draughts, sinks, where any carcases or carrion lies, or from whence any stinking, fulsome smell comes. Galen, Avicenna, Mercurialis, new and old physicians, hold that such an air is unwholesome, and engenders melancholy, plagues, and what not." After naming several towns abroad, "Salisbury with us, Hull and Lynn" are mentioned; and he goes on to say: "But let the site of places be as it may, how can they be excused that have a delicious seat, or pleasant air, and all that nature can afford, and yet, through their own nastiness, and sluttishness, immund and sordid manner of life, suffer their air to putrefy and themselves to be choked." Old Burton was evidently a worshipper of Hygeia. In the history of Salisbury, Hatcher records no less than five visitations of plague within ninety years. That more recent cholera time to which we have referred we well remember. The Archæological Institute was holding its congress there, and the then Bishop struck dismay into many hearts by his sermon, preached during the proceedings. Sorrow overspread the city. Invited on one morning by a leading citizen to dine that day, we found the inviter dead at the hour appointed! A sad time: but let that pass. It enabled the clearer heads of the city, including the writer of the pamphlet before us, afterwards to obtain better water supply and sewerage, and Mr. Middleton now tells of the gratifying result. He shows, for example, that while in nine consecutive years before the drainage the births were 244 in number more than the deaths, in nine consecutive years after it they were 929 more than the deaths; that while the average mortality, in the period named, before drainage was about 27 in the thousand, for the nine years since it was 20 in the thousand;—the cholera year not being included. The Close of Salisbury, with a population not varying much over a long series of years, presents the following facts as to mortality. For many years that mortality was at the rate of nearly 20 in 1,000; for the last nine years, since drainage, it has been only about 14 in 1,000, thus showing a death-rate lower than that of the Isle of Wight, which is 17; of Cumberland, Westmoreland, and other rural districts, the most healthy in the kingdom; for the death-rate of seventy of the districts, selected as the most healthy in England, is 17 in 1,000. This writer properly says,—

"I do not claim that drainage and water-works saved all the 531 lives, being quite aware that so many concomitant physical and moral causes exist to produce effects upon vitality—so many ways to the gates of death—that to make such claim would be as rash as to put the hand upon each of 531 persons and say, 'You and you were saved.' But, holding the strong opinions which I do about the fostering causes of many diseases being removable, and seeing what I do see in Salisbury, it would be affectation on my part not to say that I believe the works done to have been one cause, and that the main cause, of the diminution of mortality; and although it may be objected that assertion is easy, proof difficult, in vital statistics, in this case I do not think it would be easy, if possible, to suggest another even plausible cause of such a great alteration having continued for so many as nine years."

If any of our readers can suggest a more obvious reason, we shall be glad to hear it. We are unable to do so ourselves.——The admirable *Times* occasionally reminds us, by some of its leaders, of a large grand old dog, who, anxious to show his friendly feeling, bounds in amongst his friends, and begins by knocking them all over. Thus in a recent article on the sanitary condition of Calcutta, the writer starts with what might almost be considered a laugh at the sanitary reformer. "A social censor," says he,—

"Satirizing the follies and vices of the age has often been taken for one steeped to the lips in wrong-doing, who, as a last resort, is earning money for future sin by detailing the experiences of the past. But of all who take upon themselves the task of exposing the evils of the world, the sanitary reformer is surely the man who most enjoys the evil he denounces. His delight in impure water is so great that he might be supposed to be always taking 'headers' in it; he wades through filth, and whenever he comes across anything which is particularly nasty, he stirs it up for the benefit of the bystanders; and whoever has been misguided enough to attend a sanitary conference knows that his enjoyment of bad air is most practical and lasting."

But then the writer goes off into quite the right line, a denunciation of the infamous filthiness of Calcutta. Will it be believed that up to a year ago 5,000 human corpses had been thrown every year into the river which supplies the greater part of the inhabitants with water for all domestic purposes, and which, moreover, for several miles is covered with shipping as thickly as almost any river in the world? What is, however, more astounding, is the statement that more than 1,500 corpses have been thrown into the river in one year *from the Government hospitals alone*. Measures were taken by the Bengal Government last March to stop the casting of corpses into the river, and to introduce the practice of incremation, which are said to have been successful; but up to that time the veneration of the native for the sacred stream had been too powerful to be thwarted by the Government. "But these bodies thrown into the river as we see dogs thrown into the Thames, only under a hotter sun, form but one of the nuisances of Calcutta. There does not exist a properly constructed drain in the city!" Fire away, O *Times!* In no direction can thy power be more usefully applied than in obtaining improvements which will enable the peoples to live, and not die,—before their time.——Liebig's Reports, communicated to the Corporation of the City of London, on the agricultural value and economic disposal of the sewage of great towns, have been published in a complete form, by W. H. Collingridge, with the numerical quantities reduced to ordinary English standards. These documents will, we have no doubt, be sought for by many, who will be glad to find them in this accessible form. The report of the Coal and Corn Committee of the Court of Common Council forms part of the pamphlet. Our own opinion of Liebig's letters, less commendatory than some writers have expressed, is already known. A

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* A Proposal for Diminishing Crime, &c., in Liverpool. By M. J. Whitty. Liverpool, 18, Cable-street.
The Benefits of Sanitary Reform as shown at Salisbury. By A. B. Middleton. London: Simpkin & Co.
The Times.
Liebig's "Reports."
Present State of Town Sewage Question: J. & H. Parker.
Henry Mayhew's Shops of London.
Letts's Postal Almanac.
Application of Geology to the Arts. By Professor Ansted: Hardwicke.
The Art-Journal: Virtue.
The Art-Student.
The Church Builder: Rivington.
Fraser's Magazine.
Railway News.
Day & Son's "First Folio Shakspeare."
Giornale dell' Ingegnere, &c. Milan.

spark of spite unworthy of a philosopher, makes itself visible in them here and there.——"The Present State of the Town Sewage Question," by G. W. Child, M.D. (Oxford and London: J. H. & J. Parker), formed the substance of a communication made to the Ashmolean Society of Oxford in February last. The author, Dr. Child, is physician to the Radcliffe Infirmary at Oxford. It is not intended to advocate any particular scheme for the utilization of sewage as of universal application, but rather to show the present position of the question in the author's estimation, especially as he would wish it to be viewed in Oxford, where the subject presses urgently for a solution, as it elsewhere does.——No. 2 of "The Shops and Companies of London and the Trades and Manufactories of Great Britain," edited by Mr. Henry Mayhew, gives one an amusing as well as instructive insight into such matters, and promises a volume of very pleasant reading. The present part treats of the late jewel robberies in the City; the shops of America; Pickford's; the odd shops of London; Searle the boat-builder's; more curiosities of advertising; crinoline; the Hammam or Turkish bath; the percentage evil of West-end trade; the Falcon Glass-works; experiences of a town traveller; the *Times* Office; advice to young men from the country; and various other subjects.——"Hardwicke's Science Gossip," for April, seems to be chiefly of interest to naturalists. A small section of it is devoted to window gardens and aquaria.——The Rev. J. G. Wood's "Homes without Hands" has reached Part 16. Parasitic insects of various kinds, including that terrible pest the chigoe, are described in it.——"Letts's Monthly Postal Almanack" seems to be a useful penny publication, full of information as to mails, postages, and post hours, inland, colonial, and foreign despatches, and other intelligence of a like order.——And then we get "Meteorological Diagrams for 1864." Stanford, Charing-Cross. The temperature, rainfall, and atmospheric pressure during each day and night of the past year are given in this very useful diagrammatic map.——"The Popular Science Review for April" contains, as usual, a great variety of interesting matter, including papers on train signalling, by C. V. Walker; extract of meat; physical phenomena of other worlds, by R. Hunt; on the oldest known fossil, and various others; besides the scientific summary of the month and reviews of books.——A volume entitled "The Applications of Geology to the Arts and Manufactures," by Professor D. T. Ansted, F.R.S. (Hardwicke), consists of the series of Cantor lectures on geology, delivered at the Society of Arts in the session 1864-5. The lectures may be said to be merely sketches in broad outline, as each subject, if entered upon in detail, would demand a separate course of lectures, and one or more volumes to itself; but a great deal of useful and reliable matter is nevertheless embodied in these pages, which treat of such practical subjects as springs and water supply; sands, clays, cements, and artificial stones; stones used in construction; ironstone and coal; and so on.——However, we must get on another tack. In the current *Art-Journal* (it has a very good engraving *inter alia* after F. Goodall), Mr. Ruskin continues his papers titled "The Cestus of Aglaia," eloquent, but, we must take the liberty of saying, to some extent misty. We will quote a piece that is least so. He is speaking of *patience* in art, and the necessity for it:—

"For one instance only: has the reader ever reflected on the patience, and deliberate subtlety, and unostentatious will, involved in the ordinary process of steel engraving; that process of which engravers themselves now with doleful voices deplore the decline, and with sorrowful hearts expect the extinction, after their own days.

By the way, my friends of the field of steel, you need fear nothing of the kind. What there is of mechanical in your work, of habitual and thoughtless, of vulgar or servile—for that, indeed, the time has come; the sun will burn it up for you, very ruthlessly; but what there is of human liberty and of sanguine life, in finger and fancy, is kindred of the sun, and quite inextinguishable by him. He is the very last of divinities who would wish to extinguish it. With his red right hand, though full of lightning coruscation, he will faithfully and tenderly clasp yours, warm blooded; you will see the vermillion in the flesh-shadows all the clearer; but your hand will not be withered. I tell you (dogmatically, if you like to call it so, knowing it well) a square inch of man's engraving is worth all the photographs that ever were dipped in acid (or left half-washed afterwards, which is saying much), only it must be man's engraving, not machine's engraving. You have founded a school on patience and labour only. That school must soon be extinct. You will have to found one on thought, which is Phœnician in immortality, and fears no fire. Believe me, photography can do against line-engraving just what Madame Tussaud's wax-work can do against sculpture,—that, and no more."

The Editor in his "Memoirs of Authors" this time sets forth strikingly Theodore Hook, the man with two lives,—brilliant abroad, wretched at home. We heard Hook make his last public speech; heard him say *nearly* his last clever thing; but we have not space now to indulge in the look-back.——The *Art-Student* denies the rumour of its termination; and the number for the month is an agreeable and instructive one.——The *Church Builder* publishes a method of Warming Churches, which should rather be described as a method of burning and vitiating the air about to be used in a church. The fire is made to play on a stack of iron tubes *through* which the air for the church is conducted. We are not likely to recommend the system.——The current *Fraser* has a brief article on "The Embankment of the Thames," treating chiefly of the evidence before the Parliamentary Committee of 1860. A paper in it on "British Sea-fish and Fisheries" is more valuable. Many will learn from it, with surprise, the extent of the Scottish *pearl* fisheries. The fish yielding the British pearl is a species of mussel, rather small than otherwise.——From the *Railway News*, we get a notice of the work that is going on at Clapham Junction, and the preparation there making for a "'tarnal smash" one of these days. "A day's traffic," says the writer,—

"In and out of this Clapham Junction, is represented by nearly seven hundred trains, or a number which would give about one in every two minutes throughout the twenty-four hours. There is no moment of the day, from six in the morning till six at night, when there is not a train actually on one or other of the lines at Clapham; and during a large part of the day the traveller will seldom see the place without three or four trains entering, standing, or leaving the junction. There are times when this enormous aggregation of traffic is swollen by special trains. On the last Derby Day ninety-four special trains and engines passed through the station, and on an Ascot day the number is nearly as large."

It is to be hoped the signals are well looked after here: or the smash will not be long delayed.——And what have we under the yellow cover of foolscap size? Parts 7, 8, and 9, of the Sun and Stone printed first folio edition of "Shakspeare," now past its half, since sixteen parts are to complete it. The last page printed brings us up to the beginning of the 5th act of the Second Part of King Henry the Fourth, and we take from it a pregnant sentence out of the mouth of Falstaff:—"It is certain that either wise bearing or ignorant carriage is caught, as men take diseases, one of another; therefore, let men take heed of their company."——And now a publication from Italy, *Giornale dell' Ingegnere—Architetto ed Agronomo*, carried on with ability by Signor Raffaele Pareto. The March number contains a full description of the Cathedral of Parma, with a large view of the entrance-front, lithographed from a photograph. Here, however, we must wipe the pen, though not half through the packet.

CHURCH BELLS: THEIR ANTIQUITIES AND CONNEXION WITH ARCHITECTURE.*

BELLS in the Mediæval period, like most other productions of that age, are well deserving of study as works of art. A vast field of beautiful lettering and diapered ornamentation may be gleaned from the belfries of East Anglia. I have not made very extensive researches in the northern and western districts of England, but from what I have seen they must yield the palm to Norfolk, Suffolk, and Lincolnshire. The same must be said for the southern counties.

I think we may safely point to Lynn, in Norfolk, for the earliest specimens of these beautiful castings, many of which are, in their way, fully equal to what have come down to us in illuminated MSS. We find the names of Thomas and William de Lynn, of Johannes Godyng de Lynn, of the Wambis and Schep families connected with this art during the fourteenth century, all more or less diffused over East Anglia, and using lettering and stamps and diaper nearly identical. One could heartily wish that more specimens of their work remained, but the custom of augmenting peals for ringing purposes during the eighteenth century in all the larger parishes has made terrible havoc amongst them; the chances of a successful find being now much greater in the inaccessible village bell-cot than in the stately well-newelled tower. The inscriptions on the bells of this period are invariably in single capitals, each capital highly adorned, the initial ones especially so, with diapered ornament. Often the human figure is combined in various attitudes to suit the shape of the letter, usually in ecclesiastical costume. Many of the initial capitals are besides beautifully crowned. The inscription always begins with a floriated cross, more or less elaborate; and between each word is a stop, usually a *fleur-de-lys*, or sprig of some pattern. The canons are often besides elaborately moulded.

Bells with ornamentation of this particular character are not found in the fifteenth century. Whether the Lynn foundry died out, or whether it was absorbed in, or removed to, Norwich, I have not yet been able to discover. All we know is, that with the fifteenth century arose a very flourishing foundry in Norwich, conducted for some generations by the Brazier family. They seem to have founded largely, as their bells are still very numerous throughout Norfolk. With them came in a totally different kind of ornamentation. Black letter was now used exclusively, and of a very superior character. The capitals were still remarkably beautiful, and, as before, often crowned. A new class of initial cross and stops were also produced. The bells from the Norwich foundry may be readily recognised by the presence of a shield upon their crown. This shield is of three sizes, and somewhat different in detail, on each of them a ducal crown between three bells, arranged heraldically. The earliest shield had a simply diapered field. This was afterwards replaced by an ermine ground in two sizes. This foundry was carried on by various hands till nearly the middle of the last century. After the Reformation they made an attempt to return to the characters of the Lynn foundry; but whether they had preserved the original stamps, or had copies made from them, I cannot say. I am inclined, however, to the latter opinion.

Contemporaneously with the Norwich foundry was another at Bury, probably connected with the Abbey. They had a good business in Suffolk and Essex, and a little in Norfolk; their castings, however, are rough and inferior to those of the Norwich foundry. Their bells may be easily recognized by a shield, consisting of a bell pierced by two keys in saltier, a chief with a ducal crown between two pairs of arrows compounded from the arms of Bury St. Edmund's, together with a rude representation of some of their tools. This foundry came into great note under Stephen Tonne, towards the end of the sixteenth century, many of the largest and best bells in Essex and Suffolk being of his manufacture. It was afterwards removed to Thetford, in Norfolk, and either died out in the middle of the last century, or was revived again at Downham under Thomas Osborn.

The above foundries were confined to East Anglia, as was also the Sudbury foundry, of some note in the last century. Much information concerning them, particularly during the early period of their existence, has been gathered by Mr. Lestrange, of Norwich, which he hopes shortly to print. The book will be fully illustrated with specimens of the crosses, stamps, and letterings used in the fourteenth and fifteenth centuries. Other ornaments were also common besides the stamps, crosses, and lettering. I have several times met with the Evangelistic symbols used as stops between the words of the inscription; also the various emblems of saints, sometimes figures of the saints themselves, sometimes a rood with attendant figures of SS. Mary and John. On the tenor at Minster, in Thanet, the inscription begins with a good demi-figure of a priest in eucharistic vestments. Flowers were also largely used as borders. I have met with a beautiful border of daisies on a bell dedicated to St. Margaret.

Leaving East Anglia we find other foundries of early date in other parts of England; but having but scanty information concerning them, I will not detain you upon them. There are, however, certain founder's marks which were used pretty generally over England, for which a home has not yet been found—possibly they were itinerants. In the sixteenth and seventeenth centuries there was hardly a large town in England without its foundry. Many of them turned out beautiful bells so far as sound is concerned, but as works of art there is little to say concerning them. The most celebrated founder in the seventeenth century was Miles Gray. His head-quarters were at Colchester, but he itinerated considerably; the number of his bells yet remaining is marvellous, and not the less remarkable is the exceeding beauty of their tone. There are some twenty or thirty of his tenors yet in

* By the Rev. John H. Sperling. See p. 241, *ante*.

Suffolk, and that at Lavenham, though in no way better than several others, has been often moulded by bell-founders. So great was Gray's reputation that the great bell at St. Nicholas, Newcastle-on-Tyne, called the Mayor's Bell, weighing over two tons, was sent all the way to Colchester to be re-cast by him. Richard Oldfield cast some very fine bells about the same period, or a trifle earlier; his remaining works are but few—only, so far as I am aware of, to be found in Essex and Herts. A kind of lettering was adopted by him in very good imitation of fourteenth century work; his mark was an arrow on a shield between his initials, in chief and quatrefoil and *fleur-de-lys*. The only other founder of this age that I shall mention is Richard Chandler: of his whereabouts I am uncertain, and I have only seen some dozen of his bells, in Bucks, Herts, and Cambridgeshire, but his tenor bell at Melbourne, near Cambridge, is one of the finest bells in existence for its weight.

The last century saw the extinction of most of the smaller foundries, or rather their absorption into the two great establishments at Gloucester and Whitechapel. The Gloucester foundry had existed for many centuries. John of Gloucester was a bell-founder there in the thirteenth century; but under the Rudhall family it chiefly came into note during the last century, upon the decline of the Salisbury trade. Its turn came at last for amalgamation with Whitechapel, which foundry, at the beginning of the present century, may have been said to have been the foundry for England; Market Downham, in Norfolk, the last of the East Anglian foundries, being also sucked into it. There was again a considerable establishment in Reading during the sixteenth and seventeenth centuries: this was removed by the Knights to Southwark, in 1750, or thereabouts; and that again flowed into Whitechapel. At the present time we have three foundries in England: the old-established house of Mears; the Messrs. Warner, of Cripplegate, who are now getting into a large business in this department; and the Taylors, of Loughton, of whose bells I can also speak very highly, having had several orders executed by them.

So much in a very cursory way for the history of bells and bell-founding in England. I will now push on to the practical part of the subject, with which we are more particularly concerned. With all thanks to our three worthy founders of the present day for what they have done and are doing for us, I will still say, and I know that if any of them read this they will feel that I am only speaking the truth when I say, that the art of bell-founding in the present day is not what it ought to be, or what it might be. I lay very little blame, however, on their shoulders, for I am sorry to say that no art has met with so little encouragement as the art of bell-founding, or has been more crippled by the fatal mistake of expecting great results from very little money. And, believe me, nothing is more easily starved than a church bell. People now expect to get a peal of six for no more than the cost of a proper tenor. Everything in a bell is the quality of the tone; the note is a mere result of certain dimensions, and may, I believe, be reached by metal little thicker than paper. Tone depends on the material, the shape, and the thickness of the metal. Consequently, bell-founders are sorely tempted to do the best they can for very inadequate sums of money, and with a result that pleases no one. And so many a tower is only furnished with the odious ting-tang that might have had a peal had there been reasonable hope of securing the grand and mellow tones of former days.

Again, as to the lettering, stopping, and ornamentation of bells,—Why are these now altogether abandoned? It is true our founders have a black lettering, which can be used if asked for; but something better than any of them have yet is easily attainable; and, when once the moulds are made, a good design costs no more than a bad one. It may be said bells are out of sight, and so what is put on them does not very much matter. I think it does. A bell is a sacred instrument dedicated to the service of God, and religious art may be brought to bear upon it just as rightly as upon other sacred vessels. The fact of its being seen but by few does not appear to me to affect the question; for we have got beyond the notion prevalent some fifty years since, that *that* only need be decent which meets the eye of man. The same rule applies to the careful selection of dedicatory inscriptions. Now in the nature of the case it cannot be expected that each architect should provide the bell-founder with designs for the bells of any given church; but I think it should be the care of this Institute to provide each founder with legitimate forms of lettering and stops.

The next suggestion I would offer is this. We either find nothing but our little enemy the ting-tang, or an ambitious scheme for a peal of six or eight, too often realized only in skeleton by the tenor, its third and fifth forming what may be called a hop, skip, and jump style of music, the constant repetition of which is far from pleasing to the ear; and but too often the further development of the peal is unrealized. The Marylebone churches, early in the present century, were furnished with these skeletons of peals of six, and they have hopped, skipped, and jumped for the last forty years without the least sign of filling up their gaps. I am sorry to find they have even had the contrary effect of inducing other steeples to follow in their frolics, for St. Paul's, Knightsbridge; All Saints', Margaret-street; and some others have begun a similar skirmish. Now instead of this unsatisfactory music, why not be content with a really good tenor and one bell next above it? Nothing can be grander than two good bells chiming thus together. Such music is far preferable to three or four light bells at odd intervals. I am, of course, only alluding to those churches where peal-ringing is not contemplated. You are all of you probably familiar with the grand and pleasing effect of the two heaviest of the Abbey bells at Westminster chiming thus together for daily prayer. It is a return to ancient usage, besides being most dignified in itself, and satisfactory to the ear. Then, by degrees, perhaps, a third bell, also in succession, may be obtained. Three such bells would leave nothing to be desired.

The third suggestion I have to make refers only to peals of five bells and upwards. It is that there is no necessity whatever for the universal adoption of the modern major scale, which, for the last half-century or more, has been the undeviating practice. By so doing, the harmonic combinations are very much limited, and many very pleasing scales in the minor mode altogether ignored. Now, minor intervals were great favourites in the sixteenth and seventeenth centuries, from their peculiar plaintiveness and expression. This fact was forced upon my notice some few years since, when in charge of a Suffolk parish. The church tower nearly adjoined the rectory; and the peal of five was a very light one, the tenor only 8 cwt. I was for some weeks puzzled to account for its pleasing effect. Suddenly the fact dawned upon me that it was in the key of A minor. I at once took the hint, and tested the keys of all the peals in the neighbourhood: the result was the discovery of several other examples. I have tried a great many peals of the present century, but I have not yet discovered one in the minor mode. I speak under correction when I say that I do not believe there is one in all England. Now, accepting the major and minor modes as equally legitimate, see what an increase of harmonies we have. Taking D natural as the correct tenor note, and A natural as the highest for any peal, we get eight different keys for our peals; and by flattening the third, to bring them into the minor mode, the number is doubled.

After all, however, we must remember that, so far as bells are concerned, an exact scale, in present received musical expression, is of no moment whatever. So long as a peal of bells is in harmony with itself, and satisfies the ear, it matters not in what key it is, or whether in no describable key whatever. It is a great mistake to tie a founder down to any exact key or scale: it is sure to involve that evil instrument, the tuning-lathe, to reduce them to the appointed standard of pitch; when most probably they were much better when first broken out of the moulds, and even more pleasing to the ear. No bell is ever cast thicker in the sound-bow than it ought to be. The thickness of the sound-bow should be one-thirteenth of diameter; that of the waist, one-thirty-sixth of the diameter of the mouth. Many are cast far below this standard, for economy's sake. When, therefore, the tuning-lathe is brought to bear upon a bell, we may be certain that the tone is being sacrificed to the note; and, if this is bad in modern bells, what shall we say to paring down fine old bells, as I have seen done, to fit them to the shallow tones of modern additions to the peal? It is, I fully believe, to facilitate this tuning process that the proportion of copper to tin in present use is so much greater than it ought to be. The modern practice is to make the proportions three parts copper to one of tin. Now, as tin wastes considerably in the fusing, this is far too small. The proportions ought to be in thirds,—two of copper to one of tin. Bell-founders say that such a proportion is liable to render the metal somewhat brittle; and this, coupled with the thinness of the bells in the present generation, greatly increases the risk of a fracture. There is a remedy for this, however: there is no reason why the metal should not be reduced to a state of fusion twice before being allowed to run into the mould. Then, again, in the present day, the melting process is a rapid one in a roaring furnace. In former times it was slower, mostly with timber fires, and dross had opportunity of escape, which now is all fused into the bell.

I need hardly tell you that the prevalent idea of silver entering largely into the composition of ancient bells is a pure myth. So far as sound goes, silver is little better than lead, and would spoil any bell where largely used. The idea has, no doubt, arisen from the much larger quantity of tin formerly used. Mr. Lukis relates in his little work on Wiltshire bells, that when the peal of Great Bedwyn Church was taken down to be re-stocked, the canons were found to have become white in places where there had been friction, and nothing would persuade the workpeople that it was tin, not silver, that they saw. The old bell of St. Laurence Chapel, Warminster, in which tin had been largely used, was also traditionally said to be rich in silver. When it was re-cast in a field adjoining the chapel in 1657, a good deal of additional silver was thrown in by the inhabitants, as they thought to improve its tone still further. An old foreign bell at St. John's College, Cambridge, from its sweet tone is popularly called the silver bell; this, of course, being a similar delusion. The same may be said of another very pretty bell at Acton, Middlesex, called the Acton Nightingale.

Another great difference between bells, ancient and modern, is in their shape. The most ancient bells were very long in the waist, and high in the shoulder, many of them to an exaggerated degree: we now run into the opposite extreme of short waists and flat shoulders. The reason of this change is obviously connected with the art of ringing, short bells being much easier to raise, and taking up less room than bells of the old proportions. The modern founders are all in favour of this change, asserting that the note is identical in both cases, and that metal lying in the waist is useless. If they would be content with saying that it is a more convenient form, both for the pockets of the customers, the ringers, and their own moulds, I should agree with them; but there is no denying that though the note may be identical, the quality of tone is very different, and this is evident on acoustic principles. The waist of a bell is, so to speak, its sound-board. The scientific view of a bell is that of an elastic instrument composed of an infinite number of rings or circles, varying in tone according to their several dimensions, the sound arising from the vibratory motion of all of them when set in motion by the clapper. A bell properly and truly cast, will give the notes of a common chord more or less blended into one, and major or minor according to its height. This fact is easily ascertainable by striking the bell with the hand, or with a stick, in three different places: the note of the bell will form the base where the clapper strikes, and its third and fifth will be given at certain distances above. This flat bell-founding is, I fear, on the increase, and the lips are now so extended that a section of the bell would almost describe an ogee arch; hence we get the same notes at about half the weight of metal employed by our ancestors. I believe this system was first brought out at Downham, late in the last century. It was certainly adopted with Dobson into the Whitechapel foundry, for their earlier bells were of a more pleasing shape. Where money, however, is not a very pressing consideration, we still see the use of earlier and more graceful forms.

As regards weights of tenors, I think some fixed rule should be adopted; for instance, a tenor to a peal, say of ten or twelve in D, should range from 40 cwt. to 50 cwt.; and for a peal of eight, not less than 35 cwt. A tenor in E ought not to carry a peal of more than eight, and should range from 20 cwt. to 35 cwt.; but no one should attempt in E under 20 cwt.; now we sometimes see one as low as 15 cwt. F is the usual tenor for peals of six, and should range from 16 cwt. to 25 cwt.; and G, also available

for six, but better for five, should never be under 13 cwt. No higher note should be allowed for the tenor of any peal; nor should any treble be of a higher note than F natural, all the higher ones being harsh and unpleasing. And as we must not go higher than F, neither need we go lower than D. The tone of very heavy bells in the notes of A, B, and C, may be very grand as a sort of bourdon, but they are destitute of a musical effect, besides being impossible to raise for the purpose of ringing. No note is so pleasing to the ear, or so desirable for a tenor as E; even D is inferior to it, though the cost is greatly augmented.

With all care, however, and attention to these suggestions, and others also known only to the bellfounder, another great agency is necessary to perfect one bell. It is a fact, of which there is no gainsaying, that no bell, be it made ever so carefully and skilfully, sounds so well at first as it does after it has been hung some years. There is an atmospheric effect, a process of oxidization, very gradual, which goes on improving and mellowing the quality of tone as years advance. I have noticed this in several instances, and believe it to be an unvarying process. The colour of a bell changes in a few months: a greenish tint and crust come upon it; and after a long course of years the surface becomes slightly uneven, just as we are accustomed to note the process of de-vitrification in ancient painted glass. I believe it is to this process that the peculiarly quaint tone of the most ancient bells may be attributed.

Having thus pointed out the limits of a peal, I must add a word or two on the origin of change-ringing. As before stated, it was introduced early in the seventeenth century, and led to a complete revolution in the art of the bell-founder as well as of the hanger. From that time all the heavy chimes of three and four and five were reduced in weight, and multiplied in number, forming peals of six, eight, ten, and twelve. Whole wheels were necessitated in place of the old three-quarter arrangements, and often the still simpler one of leverage only. King's College, Cambridge, has the honour of having possessed the first ringing peal of five in the kingdom. According to one tradition they were a present from Pope Calixtus III. to the college; and, according to another, they were taken by Henry V. from some church in France after the battle of Agincourt, and by him presented to the college: possibly the archives of the college may be able to clear up the matter; at any rate, they were only chimed like other bells in that generation, though it is highly probable that they were the first peal on which the art of change-ringing was tried. They were heavy bells, the tenor being as much as 57 cwt.; whereas the tenor of the present famous peal of the University Church in that town is only 30 cwt., or half the weight. These bells were hung in a wooden tower westward of the present chapel, and are alluded to by Mr. Major, the historian, who, writing about 1518, states that whilst he was of Christ's College, he frequently lay in bed to hear the melody of these bells, which were rung early in the morning on festivals; and, being near the river, was heightened by the reverberation of the water. On the taking down of the bell-tower the bells were suffered for many years to remain unused in the ante-chapel, but were sold about the year 1750 to Phelps, the bell-founder of Whitechapel, who melted them down. I suspect their sale had something to do with the erection of some new college buildings.

Peals of eight were hung in a few churches early in the seventeenth century. In 1677 came out the first book on ringing; and soon after the number of peals was increased to ten, and then to twelve. The first peal of twelve was hung in York Minster in 1681, tenor 53 cwt.; Cirencester, in Gloucestershire, followed next; then St. Bride's, London, in 1718; St. Martin-in-the-Fields, 1726; St. Michael's, Cornhill, 1728; St. Saviour's, Southwark, 1735.

The honour of the invention of change-ringing is said to belong to a Mr. Benjamin Anable, who died at an advanced age in 1755. His methods were much improved and enlarged by Mr. Holt. These, together with a Mr. Patrick, have produced some of the most celebrated peals.

In conclusion, this lecture has been for the most part but in outline; time has not allowed me to fill in many a detail which I could have wished. My object, however, has been rather to suggest than to satisfy,—to give you the starting-points from which to prosecute your own researches, as opportunity or inclination may offer; I trust, therefore, it may not fail of some practical effect. Taken as works of art, our bells need a re-infusion of ancient taste; there is no reason why they should not be made as comely in shape and ornamentation as they were in the fourteenth and fifteenth centuries. There is no want of appreciation amongst our bell-founders of the beautiful lettering, stops, and crosses on many a bell which comes to them, alas! only to be melted down. I have been favoured with the loan of a very beautiful volume, belonging to the Messrs. Mears, containing *fac-similes* of many of the best ancient bells that have been sent to them for recasting, and with only some encouragement from the patrons of art, we should see our bells once again such as we might be proud to own; and not only in the matter of decoration, but still more in shape, in composition, and consequently in quality of tone, should we push on for improvement. With the scientific knowledge and applications of the present century we ought even to surpass the bell-founding of previous centuries, though we may learn of them to advantage in many things. We have seen great progress in the minor details of art, both sacred and secular, within the last few years; it has arisen in great measure from carefully tracing its sources and investigating first principles. There is much yet to be learned on the subject of bells, much to be done before we can hope to arrive at the perfection which was attained even three centuries ago, when the following inscription could be honestly written:—

"Me melior vere
Non est campana sub ere."

STREET ARCHITECTURE OF THE OLD TOWN OF EDINBURGH.

IN this paper we purpose noticing some of the distinguishing features or characteristics of the architecture of the Old Town of Edinburgh. No one can have visited the northern metropolis and have failed, as he walked along its noble Princes-street or North Bridge, to be struck by the picturesque effect produced by the lofty range of houses which, crowning the back-bone of the city, as it were, and stretching from the Palace of Holyrood to the Castle Rock, rise to a height of from seven to a dozen stories, and break the sky-line by their crow-stepped gables and high chimney-stalks. Involuntarily he finds himself repeating Sir Walter Scott's enthusiastic apostrophe:—

"The height,
Where the huge castle holds its state,
And all the steep slope down,
Whose ridgy back heaves to the sky,
Piled deep and massy, close and high,
Mine own romantic town."

There is a large class of visitors, however, who make no nearer acquaintance of this same Old Town, or are contented with such glimpses as they obtain of it in traversing the bridges on their way to visit the University and the Industrial Museum, or in proceeding from the Council-chambers up the Lawn-market, to view the Scotch regalia which are preserved in the castle. These are lions which must be *done;* but the touter but seldom proposes or is requested to guide the stranger to any of the numerous *wynds* or closes which debouch off the main thoroughfares, or to the courts they lead to. Strange apathy! for these were once the abodes of the chivalrous and the fair, of the *ancienne noblesse* of Scotland, of eminent statesmen and dignified ecclesiastics, of the highest ornaments of the bench and bar, of philosophers and poets. The noble families of Gordon, Lauderdale, Hopetoun, Argyll, Sutherland, Moray, Guise, Loudon, Lindores, and others, dwelt in those wynds. There, from that window, did John Knox thunder forth his biting denunciations of Popery: from the balcony of that other, forgetful alike of lady-like dignity and of the forbearance due to a fallen foe, did the newly-married Marchioness of Argyll stand in the midst of her wedding guests, and spit at the gallant Montrose, as he was led into Edinburgh, in humiliation and contumely, to abide his execution. From that staircase, in the Grassmarket, did a determined and resolute mob, not yet a century and a half ago, taking justice into their own hands, hang Porteous, the obnoxious captain of the Old City Guard, from a dyer's pole. Down the Bow there, if you will believe tradition, thundered Satan himself in a carriage, drawn by six headless horses, to pick up for a midnight drive his friend, the infamous Major Weir, who in 1670 had been strangled and burned at the foot of the Calton Hill, on the spot where now stands Lady Glenorchy's church.* The inn where Dr. Johnson and Boswell lodged, and where the former, as Lord Stowell informs us, got into so violent a passion at the waiter for sweetening his lemonade with his fingers; the house where the author of "Humphrey Clinker" resided; and that other where David Hume first saw the light,—surely those ought to attract the steps of many a pilgrim. What a galaxy of legal talent, too, has dwelt in this Old Town! Sir George Mackenzie, the bloody Lord Advocate, as his detractors termed him; that other Mackenzie, known from his principal work as "the Man of Feeling;" the Earl of Stair (author of the "Institutes"); Lords President Blair and Forbes, of Culloden; Lords Fountainhall, Glenlee, Corehouse, Bankton, and Braxfield,—these are but a few of the celebrated jurisconsults who were denizens of Auld Reekie. Indissolubly associated, too, with these old wynds, around which they have thrown a halo of poetry, are Allan Ramsay, Robert Ferguson, Robert Burns, and Sir Walter Scott.

In Sebastian Munster's "Cosmography," published at Basle, in 1550, there occurs this passage in a descriptive notice of Edinburgh:—"From the High-street (*Vicus Regius*), there extend both to the north and south many alleys, all of which are replenished with lofty houses; as is also the Cowgate (*Vicus Vaccarum*), in which dwell the patricians and senators of the city, and in which are the palaces of the magnates of the kingdom, where nothing is humble or rustic, but all is magnificent (*ubi nihil est humile aut rusticum, sed omnia magnifica*)." Hear another witness writing seventy years later—John Taylor, the Water-poet of London, in his "Pennylesse Pilgrimage," thus speaks of the Canongate:—"Herein are gentlemen's houses, much fairer than the buildings in the High-street, for in the High-street the merchants and tradesmen doe dwell, but the gentlemen's mansions and goodliest houses are obscurely founded in the aforesaid lanes: the walles are 8 or 10 foote thicke, exceeding strong; not built for a day, a weeke, a monthe, or a yeere, but from antiquity to posteritie for many ages."

The glory of these old buildings or *lands* has indeed faded. No longer inhabited by the noble and the wealthy, many of them have been abandoned to the very lowest dregs of the population,—a hungry "half-fed, half-sarkit" race of low Irish and Scotch being the tenants. "Decay's effacing fingers" have been busy in earnest,—

"Fire, time, and modern taste, the worst of all,
Have swept in ruthless zeal across the scene."

Enough, however, still remains to interest the antiquary and the architect.

The different progressive stages of the Old Town architecture are well defined, and afford a good test of the different ages in which each building has been erected, which again can be verified by the numerous armorial bearings, inscriptions, and dates carved upon them, as well as by documentary evidence.

In what may be termed the first stage of the domestic architecture of Edinburgh, or that prior to the commencement of the sixteenth century, the *tenements*† or houses of the better class consisted of a substantial ground flat, surmounted by a second story of wood, access to which was obtained by an outside stair. The roofs, which were very highly pitched and pierced by storm-windows, were covered with thatch. Specimens of houses of this period are still to be met with in the Grassmarket, the Cowgate, and the Pleasance; slates, however, having been substituted for the thatch. Sometimes the

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* "An' then there's the Major, sin' less winna ser' him,
His servitude haulds o'er the Crook o' the Bow,
Wi' his tittie, sin' better folk wunna gang near him,
Come thundering at midnight in glamour a' low;
The Deil for their coachman; a whup wi' some smeddum,
As needs maun wha drive wi Auld Clooty to lead 'em.
Hurrying doun, stoiterin' an' stumblin',
The gleger ye gang better luck against tumblin'!

Or belyve, for a change, just as twal' is a bangin',
Whir, oot frae the pend, in a whirlwind o' flame,
Ilk cloot, wi' a low frae the causey it's clangin',
The headless hell-charger gangs gallopin' hame;
Ill luck to the loon says gude e'en as he's gangin',
He were better gae doun the Wast Bow to his hangin.'
Hurrying doun, &c."

† A tenement often contains a number of houses. "*Tenement*, as a word for house, is used everywhere in Scotland in reference to any species of street building; but *land* from its being so long applied exclusively to the tall houses of the Old Town, which were invariably divided into flats, is only at this day applicable to that description of mansion, and is confined to Edinburgh."—*Introduction to Chambers's Reekiana*, xvi.

second story projects over the first, and, resting upon wooden beams, forms a kind of piazza. An example of this is to be seen immediately to the east of Baron Grant's Close, in the High-street, although the piazza has been blocked by windows in such a way as to seem at first sight to form a basement story running flush with that above it. Better examples, although of a later date, are the timber-fronted tenement at the Bow-head, and another at the head of the High School Wynd. Merchandise was exposed for sale in these piazzas.

The year 1508 saw the dawn of another stage in the domestic architecture of the capital. In that year King James IV. passed an edict, giving permission to the citizens to extend their houses 7 ft. farther into the street by means of wooden projections. As an inducement, they were allowed to cut down and remove, without any charge, the oak and other timber which then covered the Burgh Muir. The burghers rapidly availed themselves of the privilege thus granted to them; and the result is those grotesque piles of gable-fronted houses with each succeeding story overhanging the one beneath it, which seem to the astonished tourist more likely to topple over than even the leaning Tower of Pisa. Go into the closes, too, and the opposite lands have approached one another so as almost to touch. The denizens of these "timber-fronted lands" may shake hands across the common street without leaving their respective homes to any further extent than putting their arms out at their windows. This style of building continued more or less in vogue until 1677, when, on account of the danger to which the inhabitants were exposed from fire, a law was passed prohibiting the erection of wooden buildings within the burgh.

Another peculiarity arising from the permission to project the upper flats into the street, consisted in the position of the gates which defended the mouths of the wynds. These having been placed there at the first erection of the buildings, came to occupy a position 7 ft. behind the front of the street. The gates have indeed been removed, but the heavy iron hooks on which they were swung and the gateways still remain.

An outer or fore stair led up to a gallery in the second story in the wooden houses, or to a doorway in those of stone. An instance of the former arrangement may be seen in the house below Baron Grant's Close, already adverted to, and a stone land at the head of Blyth's Close, in the Lawnmarket, especially noticeable from its having the aphorism LAVS DEO, and the date 1591,* wrought in antique iron letters and figures on its front, presents an example of the latter. Another very common arrangement, though of somewhat later date, was to have the staircase placed in a circular or octagonal tower situated at the back of the building and running up its entire height. Access to the doors of these towers is obtained by an archway communicating with the front of the street. As the door is almost invariably placed at an oblique angle to the passage or archway, it is probable that this was done more for security than convenience of access, the opposite wall preventing the use of a battering-ram against the door. These staircases are generally well lighted by large square windows, crossed by parallel slips or bars of wood; and the stairs, which are called *turnpikes* in Scotland, ascending in corkscrew fashion round a newel, are broad and of easy ascent. Good examples of this species of staircase tower may be seen by passing through the Old Playhouse Close or Coopers' Entry, both of which are situated on the south side of the Canongate.

Sometimes where the site of the staircase is necessarily cramped by neighbouring buildings, the doorway enters under a boldly corbelled out angle. An excellent example of this may be seen in the first court in Riddle's Close in the Lawnmarket. Near John Knox's house there is a curious hanging turnpike stair, supported on corbels, which are formed by the projection of the stone steps on the first floor beyond the wall. There is a very beautiful staircase tower surmounted by a dormer window, which occupies the right angle formed by two buildings on the south side of the Grassmarket, and is corbelled out, so as not to impede the entrance to a close, which, running flush with the wall of the one house, passes underneath the end of the other. Upon entering any of these staircases, the visitor may possibly discover a square hole in the wall, the purpose of which he is not likely readily to discover. One end of a thick wooden beam used to be slipped into this, and the other resting against the closed door, afforded great security against any attempt made to force it. Sometimes, as is the case with Sir Archibald Acheson's house in the Canongate, the bar was slid into two holes, one at either side of, and behind the, door.

The stone lands are generally very lofty, rising to a height of seven and eight stories towards the street; while, in consequence of the precipitous character of the hill on which they stand, their back façades have as meny as ten, eleven, and twelve flats. The gables are ordinarily surmounted by a tall chimney stalk, or stack of chimneys. Sometimes they terminate in a finial, as is the case with one of the gables in the Abbot of Melrose's mansion in Dickson's Close,—the finial being in the form of a curious *fleur-de-lis*. A *fleur-de-lis* also crowns the very lofty stone gable of the house second from the Bow-head; and there is a very large and beautiful Scotch thistle surmounting a gable on the south side of the Grassmarket. Most frequently the gables face the street, and their different heights and angles add much to the picturesque appearance of the streets of the Old Town.

Occasionally we find a half gable crow-stepped, and terminating in a lofty chimney-stalk. There is an excellent example of this in Milne's-court, which, irregularly studded with glistening oyster-shells, presents a very picturesque effect, as seen from the Mound towering over and behind the Free Church College. The stone gables are almost invariably crow-stepped; and the earlier examples present a series of pediments surmounting the steps. An excellent example of these pedimented crow-steps may be seen on the gables of the Cunzie House, or Mint, which stands in the Cowgate, and the principal entrance to which bears the date 1574. A little timber-fronted building in the Candlemaker-row, and at the south-east entrance to the Grassmarket, known as the *Cunzie Nook*, shows a series of lofty French-like crow-steps surmounted by pediments. The pediments are frequently richly decorated. At a later period, when the plain square crow-step was adopted, the lowest of them generally bore the arms or initials of the founder or the date of the erection. In Dickson's Close, a stone tenement, dating from the early part of the sixteenth century, has the Haliburton arms sculptured on the lowest crow-step. The monogram I. H. S. occupies the same position on a building in the College-wynd, which at one time was a *collegium sacerdotum* in connexion with the Church of St. Mary-in-the-Fields, and the tailor's device of three balls of thread is similarly situated on their fine old hall in the Cowgate, memorable from the fact of from 200 to 300 of the reformed clergy having met there in 1638, to consider the Covenant before presenting it to the multitude for signature. Several ranges of crow-steps run up the centres of the roofs of the palatial hospital of George Heriot, built in the beginning of the seventeenth century.

The roofs of the sixteenth and seventeen centuries are often ornamented with cannon-shaped or grotesque gurgoyles, which serve the purpose of gutters. Good examples of the former kind may be seen on an old grim-looking tenement on the south side of the Castle Hill, which belonged to the ducal family of Gordon, and on the fine tower of St. Magdalen's Chapel in the Cowgate; and on the roof of the Abbot of Melrose's mansion, in Dickson's Close, there is a very curious gurgoyle of antique form.

Dormer windows, with gablets running into the roof, are very common in houses of the sixteenth and seventeenth centuries. They have generally triangular pediments, more commonly of stone than of wood. The pediment is sometimes crow-stepped—more frequently surmounted by a finial. These finials vary very much in design—the thistle, rose, *fleur-de-lis*, crescent, escallop shell, and Templars' Cross being the more frequent devices. Within the pediment are sometimes found sculptured the arms, initials, or monogram of the original owner, or of himself and wife. On the east wing of the Tailors' Hall there is a pediment over a window, with *fleurs-de-lis* at the two sides and the apex, and a pair of shears, and the date 1621 sculptured within. The pediment of one of the windows of Sir Archibald Acheson, of Glencairney, in the Canongate, contains the initials of himself and wife. In some cases, where the dormer windows are half above and half below the level of the wall, a bold string-course is carried round their lower halves, and immediately beneath the roof.

In buildings of the time of James VI. and Charles I., the highly-pitched roof has occasionally a second tier of dormer or storm windows, presenting the picturesque appearance of the steep old Flemish roofs. The ancient hostelry in the White Horse Close, the front *land* through which runs the Playhouse Close, Lord Dirleton's house in the Canongate, the tenement immediately behind the Old Corn Exchange in the Grassmarket, and another in St. Mary's Wynd, are favourable examples of houses with two ranges of dormer windows. A more particular description of the two first-mentioned buildings may interest the reader. The White Horse Close has been said, but on no very reliable authority, to owe its name to Queen Mary's having kept a white palfrey at stables there. It possesses the additional fictitious interest of being the quarters assigned by Sir Walter Scott to Captain Waverley, after he had joined Prince Charles Edward's standard in 1745. The hostelry, to which most antiquaries assign the beginning of the seventeenth century as the period of its erection, presents, when viewed from the north back of the Canongate, an imposing and uniform range of buildings resting upon a series of low-browed arches, now all blocked, with the exception of one which gives entrance to the inner court. The basement story, which is strongly arched, was, according to a very common arrangement in the seventeenth century, fitted up as stables. The gables are crow-stepped, and the roof, which is very steep, has two ranges of dormer windows, nine in the first row and three in the other. Passing under the open archway, the visitor ascends a steep pend, and finds himself in a large open court of an oblong form, where he has an opportunity of examining the south façade, less regular, but perhaps on that account more picturesque than the northern. A broad flight of stone stairs, flanked by substantial sloping walls, leads up to the first landing, and, diverging to the right and left, gives access to two very picturesque wooden porches overhanging the basement story. They are surmounted by triangular pediments, now made to serve as dove-cots. On one of the dormer windows of this front is incised the date 1623, which is probably that of the erection. The court, on the east and west sides of which there are several antique houses with outside stairs, communicates with the Canongate by another archway, which passes underneath an old tenement known as Bishop Paterson's house.

The *land*, the centre of which is pierced by the Old Playhouse Close, is a substantial four-storied house of polished ashlar, and stands a little back from the other houses in the Canongate. The first row of dormer windows, five in number, have plain triangular stone pediments, crowned by finials representing a thistle, rose, *fleur-de-lis*, shamrock, and star respectively. The windows of the second tier are the same in number, but are considerably smaller, and are surmounted by wooden pediments. I have already taken notice of the staircase tower at the back of the building. Over the entrance to the stair there is an ornamental tablet with a Latin inscription, which is now so much defaced and obscured by white-wash as to be all but illegible. The gables have plain square crow-steps. This house, the lower portion of which is at the present day a tavern, was built in Charles I.'s reign. Nearly opposite it a radiated arrangement of the causeway indicates the original site of St. John's Cross, which now stands against the wall of the Canongate Tolbooth. The spot marks the ancient ecclesiastical boundary of the city. The lion heralds still read the Royal proclamations at this spot.

Many houses belonging to the sixteenth and seventeenth centuries have bartizaned roofs and ornamental copings. The house referred to as standing on the south side of the Castle Hill is thus bartizaned, and another excellent example was lately pulled down to make room for the erection of the new corn exchange in the Grassmarket. Upon these bartizans and the *fore-stairs* the citizens were wont to assemble to view processions, pageants, and other sights of interest. "A historian of Queen Mary's time tells us, that when that unfortunate lady was brought along the street, after being taken into the keeping of the Confederate lords at Carberry, the women stood on these stairs, and reviled her with vulgar abuse, in reference to her late infamous marriage."* The fact of the Grass-

* This land is undoubtedly much older than this date, which it is probable was placed on the ashlar front after removing the wooden front.

* Introduction to Chambers's "Reekiana," p. xxv.

market having been from Charles II.'s time till 1784 the common place of execution may account for the prevalence of bartizaned roofs on its buildings.

In the better class of the older mansions the windows were divided by stone mullions, and were furnished with leaden casements. Occasionally they were also divided by stone transoms. There is a fine old tenement in Chalmers's Close, reasonably presumed to be the mansion of John de Hope, who came from France in 1537, and was the founder of the noble family of Hopetoun, in which the principal windows have clearly been divided by stone mullions and transoms, and are ornamented with rich mouldings at the sides. In another old building on the west side of Blackfriars' Wynd, which has a timber front, there are moulded windows which present traces of having been divided by stone mullions, on the original ashlar *façade*. The same is true of the neatly-moulded windows which adorn an old stone *land* in Baxter's Close in the Lawnmarket, interesting, it may be mentioned, *en passant*, as having been the house in which Burns first lodged in Edinburgh.

Another description of window was divided by a wooden transom, the upper half being glazed and the lower filled in with wooden shutters, often very finely carved on the exterior. Good examples of this kind of window are to be seen on the square turret of the Cunzie House in the Cowgate, in Riddle's Close, Lawnmarket, and on a projecting staircase on the north side of the Grassmarket. There are a good many such windows in the older houses in Leith. The shutters are generally made of oak, and the most common ornaments are the *egg and arrow* and the *linen pattern*.

In Baxter's Close, in the Lawnmarket, there is a very curious succession of windows, one above another, divided by such narrow lintels or transoms as to present the strange appearance of one single window from top to bottom of the building. The same peculiarity is observable in Heriot's Hospital, where the segment of an octagonal tower in the south façade is lighted through its whole extent by a succession of Gothic windows, filled with stained glass, and separated only by transoms, which thus form one lofty oriel.

Occasionally the window is boldly corbelled out from the wall. There is a beautiful double window corbelled out in this way in an old stone tenement of the early part of the sixteenth century in Dickson's Close; and Heriot's Hospital presents several examples, the most noticeable being over the entrance from the quadrangle to the chapel.

The lintels of the windows not unfrequently have carved upon them, in bold relief, armorial bearings, inscriptions, and dates. There is a stone tenement in Baillie Fife's Close with a window on which are carved two stars in chief, and a crescent in base—the family arms of the Trotters—with the initials T. T. and J. M., and the date 1612. Sometimes in the older houses, while the Gothic style was yet predominant, the windows are found ogee-arched. In a projecting staircase on the east side of the College Wynd, there is a window so shaped. It is fitted with the antique oaken transom and oaken shutter beneath.

Pediments are common over windows belonging to the seventeenth century, and frequently contain inscriptions. In the house in Trunk's Close, built by Sir John Scot, of Ancrum, in 1670, there is a window, the pediment of which contains this aphorism:—"Hodie · Mihi · Cras · Tibi," boldly carved in Roman letters. The pediment over one of the windows of the Tailors' Hall has sculptured within its tympanum a pair of shears (the badge of the trade), the date 1621, and this inscription:—"God · Give · The · Blising · To · The · Tailzer · Craft · In · The · Good · Toun · Of · Edinburgh." It may be mentioned in this place that Heriot's Hospital, founded in 1628, has no less than two hundred pedimented windows. The pediments are triangular, semicircular, and open in the middle, the design being exactly alike in no two of the whole number.

During the seventeenth century, when the Gothic forms began to give place in Scotland to the unbroken lines of Italian composition, instead of the dormer windows breaking the line of the roof, we find the pedimented window appearing as a panel in the wall face beneath. A very good example of this is to be seen in Aberdour House.

Ornamental string-courses, often very irregular, ornament the better class of the old ashlar-fronted buildings. In houses of the seventeenth century, the eaves string-course is often carried round the windows, giving the latter the appearance of projecting from the wall.

Many of the houses built prior to the Reformation have decorated niches often let into abrupt corners, which doubtless once contained statuettes of the Holy Virgin and lamps to arrest the attention of the passers by. Over the gateway of the *Collegium Sacerdotum* in the College Wynd, previously adverted to, there originally stood, although it has since been transferred to another part of the building, a highly decorated Gothic niche with an ogee arch, above a lintel, on which is beautifully sculptured this pious wish,—"*Ave Maria, Gratia plena, Dominus tecum.*" Niches are also to be found on buildings of a date later than the establishment of the reformed religion, which were probably occupied by the busts or effigies of the founders or of eminent persons. Over what was the principal entrance to the Cunzie House there is an ornamental niche now empty, and beneath it, on the lintel of the door, is the inscription in Roman letters, "Be · Merciful · To · Me · O · God · 1574." The south façade of the Morocco Land in the Canongate has a curious effigy of the Emperor of Morocco in Oriental costume occupying a pulpit, which projects from a niche over the second story. This effigy was placed there in the year 1574. On the picturesque old house in the High-street, for long the residence of John Knox, one of the angles has a small effigy of the Reformer occupying a pulpit. His right hand points to a carved stone or tablet, on which is carved the name of the Deity in Greek, Latin, and English.

Ornamental stone tablets, with armorial bearings, devices, and inscriptions, carved upon them are very common, and are to be found on all parts of the exterior, although the most common position is over the principal doorway. The Shoemakers' land, in the Canongate, has a tablet of this kind over the main entrance. It is highly ornamented with cherubs' heads, and contains the Shoemakers' arms and the date, 1677, while on the pages of an open book is carved the first verse of the 133rd Psalm. A tablet over the door of a lofty stone tenement in the Cowgate has a sculptured representation of two men carrying a barrel, *sting and ling* fashion,—that is suspended to a pole resting on the shoulder of each.

A great variety of design is observable in the principal doorways. Pointed arches are to be met with, but they are rare. There are many beautiful Gothic doorways, with ogee arches and sculptured tympana, dating chiefly from the beginning of the sixteenth century. In Blair's Close, a turnpike stair, which forms the original main entrance to the whole building (that already mentioned as the residence of the Dukes of Gordon), is entered by a handsome Gothic doorway, surmounted by a sculptured tympanum, which, unfortunately, is greatly disfigured by whitewash. The arch is ogee, and in the tympanum are sculptured a coronet, and two deer-hounds as supporters. The Earl of Morton's residence, on the west side of Blackfriars' Wynd, has a similar doorway, the tympanum containing a coronet supported by unicorns.

In houses of the sixteenth and seventeenth centuries the doorways are generally square-headed and richly moulded. Their architraves and lintels are in general decorated with sculptured coats of arms, the names and initials of the owners or founders, and inscriptions chiefly of a pious character, others being terse and epigrammatical. On the east side of the Fountain Close there is a highly-ornamental entrance, consisting of two doorways, on each side of which narrow pilasters support the architrave. Above the pilasters are sculptured the words and date, "Vincit Veritas, 1573;" while the architrave bears the names of the proprietor, Adam Fullerton, a zealous friend of the Reformation, and of his wife, and the inscriptions, "Only · Be · Cryst" and "Aryis · O · Lord." On the architrave over the principal door of an ancient mansion in Blackfriars' Wynd, there are sculptured a shield with armorial bearings, and the date 1619 above, and a hand beneath, the index finger of which points to these inscriptions:—

"In · Te · Domine · Speravi.
Pax: Intrantibus
Salus: Exeuntibus."

Over the doorway which gives access to the curious hanging turnpike stair in Society's Close, already mentioned, is the following inscription:—

"R. H. Hodie. Mihi. Cras. Tibi. Cur. igitur. Curas."

The date is effaced. Over the entrance to Rae's Close there is sculptured the following beautiful prayer, unfortunately partly concealed by a modern shop-front:—

"Miserere Mei Domine; A Peccato, Probo, Debito,
Et Morte subita, me libera · 1 · 6 · 1 · 8."

Similar inscriptions in Latin and in Scotch, many of the latter being quotations from the Psalms of David, are to be found in great abundance, both on the architraves of the doorways and in the ornamental stone panels which are of so frequent occurrence on the façades of houses of the seventeenth century. We shall only add one or two more examples of the "proverbial philosophy" of the period. On the Marquis of Huntley's house occur these two inscriptions:—

"Constanti · Pectori · Res · Mortalium · Umbra;"

and

"Ut tu linguæ tum, sic ego mearː aurium Magister sum."

The Canongate Tolbooth exhibits the following:

"J · R · 6 · Justitia et Pietas Valide sunt principis arces;"

and this piece of doubtful consolation to those incarcerated within its walls:—

"Sic itur ad astra."

The letters of these inscriptions are sometimes variously coloured, and the coats of arms emblazoned, as is the case with the burgh arms upon the Canongate Tolbooth.

It is not easy to understand how so few of the doors themselves remain. They were generally made of oak, and studded with iron nails or nobs. There is a fine oak door, ornamented with fine carving, to be seen in what has been the principal entrance to a large mansion in South Foulis's Close.

The doors of the older houses were furnished with risps or tirling-pins in lieu of knockers. These consist of a notched or rasped iron rod, up and down which the applicant for admission draws an iron ring. The London reader may see a couple of these tirling-pins in the British Museum, and when he visits Edinburgh he will find one on the door of an old tenement in the College Wynd and another in Toddrick's Wynd. A very handsome one was removed, a few years ago, from an old door of the Cunzie House. Allusion is made to the risp in this verse of an old Scotch ballad:—

"There came a ghost to Margaret's door
Wi' mony a grievous groan;
And aye he tirled at the pin,
But answer made she none."

DESTRUCTION OF BUILDINGS BY FIRE.

THE reference made in our recent article on the destruction of Saville House,* to the fact of the great length of time that elapsed before the fire was communicated to the top story, notwithstanding extraordinary fury of the fire in the story next below, led soon afterwards to inquiry into the structural formation of the flooring; which last, we had remarked, could not have been of the ordinary description, or as in the common kind of London house. Upon an investigation of the circumstances by Mr. T. Hayter Lewis, who is surveyor to the Union Insurance Office, and holds a similar position under the committee of the London Fire Brigade, it was found that the flooring between the two stories had been constructed very nearly after the manner, and with the features, to which we alluded as capable of affording a considerable amount of fire-resistance. Mr. Lewis, in writing to us, says,—"There was a good plastered ceiling; and the space between ceiling and floor was filled in, to a considerable extent, with small sea-shells (bivalves); one of which I send you with this. They had been put in loose, and not cemented or concreted together in any way." He also says that the floor-boards were tongued, in great part at least. The shell is a common cockle-shell.

This explanation affords to our mind proof that the value of a plaster-ceiling, well laid, and of the best constructed floor, with pugging, is considerably greater than has been lately estimated, judging from practice, and from the use of the term *fire-proof flooring* for methods of construction which may be inferior,—or rather, probably are so by very much. But, that the entire impression of this should be felt, it would be necessary to have witnessed the fury of the flames to which we alluded. The valuable

* Page 167, "Saville House: Why was it Burnt?"

lesson to be learned for improved construction of that class of buildings in which fire peculiarly involves danger to life, is that vacancies between timbers, and behind skirtings and similar finishings, should be avoided, and that especial attention should be given to the plasterers' work, as well as to strength of joists.

In the article mentioned, we referred also to the necessity for greater attention than seemed to be given to the gas arrangements in many buildings. On the occasion of the inquest on the fire of Covent Garden Theatre, we remember that Mr. Braidwood mentioned some important facts as to the danger from gaslights placed at what might seem to be a sufficient distance below woodwork. It would be well that the results of any experience on this subject were now published. The recent destruction of theatres may be due to this cause, operating after long continuance of the desiccation which buildings of this kind undergo nightly.

It seems that there is considerable misunderstanding as to the circumstances under which destruction of a building by fire may be due to an explosion of gas. *Explosion* does not occur except there be a mixture of the gas and air; and it will not occur if the air or the gas be greatly in excess, one of the other. The gases generated during an explosion of coal-gas (the gas of gas-lighting), and on or during combustion of the gas, are not only not capable in themselves of burning, but would if present to any large extent, extinguish fire. This is taken advantage of in the principle of Phillips's Fire Annihilator. But there is *flame* when a mixture of the gas and air is exploded; and such flame may ignite inflammable material with which it comes in contact. It would probably ignite any gas escaping from a pipe. Should the escape have been taking place near to any easily-combustible object, we may imagine how the latter might be set fire to; or, we may see how the same result could occur from the flame of the explosion merely.

THE ALBERT BRIDGE: FROM CHELSEA TO BATTERSEA.

In forming an opinion as to the relative merits of the systems of engineering practised in our own and in earlier times, there is at hand, perhaps, no readier means of enabling us to effect a comparison of this kind than by bringing into view the various styles and methods employed in the construction of bridges.

Dating from the times of the erection of the old and unsightly wooden structures, of which Battersea and Putney bridges yet remain as examples, we have, in the successive undertakings of this character, a sort of permanent record of the progress made in static science. Nor is it unimportant, perhaps, to observe along the pathway of architectural study which these numerous structures may be said to form, those points where art and science seem more to have approached one another, until at last, following up this observation to our own time, we may soon hope to see them blending, as it were, into the mass and design of the structure itself with such harmony that their points of contact will altogether disappear.

The most striking departure from any recognised model in the construction of bridges is more strongly suggested, perhaps, at that period when their openings or spans began to diminish in number and consequently to increase in size, thus requiring a smaller number of piers or supports. Prior to this time, the weight of such structures was upheld with a safety apparently proportionate to the number of openings of which they were formed, so that their foundations were not very wide apart. But this modification in the length of span gradually prepared the way for the introduction of the suspension system, which had for its object the removal of all the intermediate piers between those nearest the shore at either side; and it was considered at one time as likely to become extensively employed in practical engineering.

The application of some such means for effecting communication between the opposite shores of rivers, as well as in cases where shorter junctions were required, had for a long time occupied the attention of scientific engineers. The experiments carried out by Stephenson as to the erection of the tubular bridge between Anglesey and Carnarvonshire, were, upon these grounds, followed up with much interest. The incautious use of iron for purposes of this kind then began to be discussed abroad, and perhaps somewhat opportunely, as an opinion seemed to have taken a pretty general hold that there were few laws or limits to its application. The conclusions therefore arrived at, at this time, marked an important era in constructive science.

The suspension system underwent innumerable and severe trials, and it resulted in the proof of its unfitness for structures of this class, where they were required of unusual magnitude, or to support heavy loads; although it was adopted upon a lesser scale, and where a comparatively small moving load, at slow speed, had to be sustained.

In the course of his experiments, it does not seem to have been largely considered by Stephenson or by Brunel, who sought to render it popular and useful, that the principle of suspension itself was amenable to modification and improvement. Owing to various and successive attempts brought to bear in this direction since their time, we now begin to see most of the more serious objections to its extended use disappearing one by one.

Some idea of its utility may be inferred from the fact, that notwithstanding the many drawbacks which had hitherto excluded it in so large a measure from the attention of the practical engineer, it, nevertheless, was attempted to be employed,—in many cases with great want of judgment, and in some, not without absolute danger. It had much in its favour, always on account of its comparative economy with the systems it was intended to supersede, but it could not easily escape being considered untrustworthy wherever a firm structure was required. Its cheapness alone, however, formed a recommendation which led to its being subjected to numerous trials; for at the time when it was first sought to be introduced, the cost of the construction of bridges was very great. London Bridge, for instance, which was begun in 1824, and finished in 1831, designed and built by Rennie, of granite, cost, with approaches, not less than 2,566,268*l.*; and Southwark Bridge, chiefly constructed of iron, was erected by the same engineer, at a cost of 660,000*l.* The approximate cost of the first suspension-bridge over the Thames, that erected by Brunel at Hungerford, was 90,000*l.*; the approaches, in this case, being of course less than in the others already named; but however great the saving in this as compared with the cost of other bridges, it still wanted that essential feature which could alone bring it into general use, by reconciling the public to freely adopt it. So great was the fear to employ this bridge for any other purpose besides passenger traffic, on account of its excessive oscillation, that while in London it seldom went by the name of the locality in which it was placed, as the other bridges along the Thames commonly do; but, up to the time of its removal, it was almost invariably known by the principle employed in its construction, which never failed to be associated with a certain sense of danger.

This feeling was no doubt exaggerated from the novelty of the thing, though from some points of view it was justified and acknowledged to be not altogether without foundation.

For some purposes such a class of structure was evidently impracticable; and, where anything beyond passenger and ordinary vehicle traffic had to be provided for, it was seldom employed. The suspension system accordingly appeared to have sunk into disuse, as, compared with what was expected of it, only a limited number of structures of the kind came to be erected.

The Albert Bridge, which, perhaps before this, we should have stated, is designed by Mr. Rowland Mason Ordish, of the firm of Ordish & Le Feuvre, engineers to the Amsterdam and Dublin Exhibitions, does not appear to resemble in its construction the ordinary and generally-known structures of its class. Its chief distinction, however, seems only to be, that it is secured from oscillation, or movement, it being virtually rigid in those parts which are moveable in the suspension-bridges already in use.

The want of stability formed, as is, perhaps, well known, one of the great difficulties, apparently, to overcome with regard to this class of structure.

The Albert Bridge is intended to be so constructed that it will support moving and stationary loads with a safety equalling that of any of the bridges at present used for purposes of railway traffic over the Thames; while it is stated to be more adapted for this purpose where wider spans have to be bridged over, so that it is capable of being used where other structures could not be erected with facility for purposes of railway accommodation.

The Albert Bridge will be erected over the Thames uniting Oakley-street, Chelsea, to the Albert-road, Battersea Park; and has already been commenced at the Albert-road abutment.

We give a general view of the intended bridge. The piers, as shown on the opposite page, will be formed of cast-iron cylinders filled in with concrete and masonry. The diameter of the cylinders above high-water is 16 ft., and beneath the bed of the river 22 ft. On the tops of the cylinders a series of ornamental cast-iron brackets are arranged, forming, as it were, a sort of capital to the cylinders, and supporting the footway where it is necessary for it to pass round the base of the towers without interfering with the uniform width of the roadway. The two columns forming each tower are connected at the top by an ornamental lattice girder, under which an arch is formed of ornamental cast-iron spandrels, which terminate about half-way down the length of the columns at either side. The engraving at top of page shows where the Catenarian chain is suspended at the extreme height of the towers, and immediately beneath the portion which incloses the saddles of the main chains. The engraving at the bottom shows the anchorage of the main chains and general outline of the abutments. The other details explain themselves. The bridge will have three spans, the middle one being 453 ft. 6 in., and the side openings each 152 ft. 3 in., which, with the diameters of the piers, will bring the total length of the bridge, exclusive of the length of the abutments, to 790 ft. The width of the bridge will be 40 ft., forming a roadway of 26 ft. 6 in., and two footpaths, each 6 ft. 9 in. wide. The platform will be supported by iron chains, extending in straight lines from the abutments to the tops of the towers, and thence to the required points of the roadway, forming a series of bold triangles with the longitudinal girders and towers. The main chains will be kept straight by means of an auxiliary curved chain suspended above them along their entire length. This is permitted to slacken until it assumes a deflection corresponding with the inclination of the main chains to the roadway, and then, when "set," vertical tie-rods will connect it to the main chains.

As the Catenarian chain acquires its maximum deflection where the major angles intersect, the rods which unite it to the main chains do not reach any undue length.

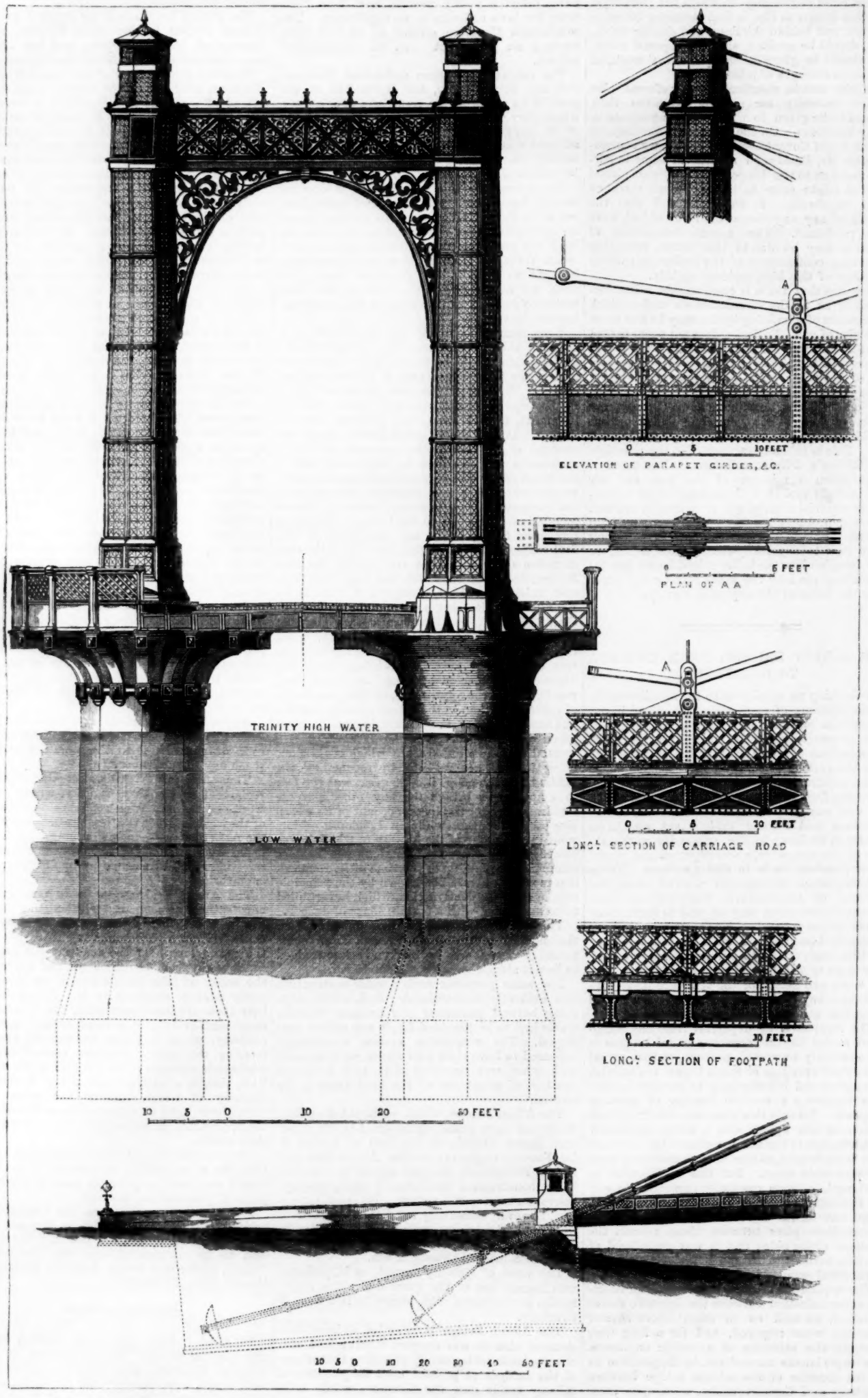
Thus there is apparently altogether attained a reciprocal or combined rigidity, as far as this word may be used with reference to structures of the kind, between the ties, the Catenarian, and the main chains,—a combination which is, perhaps, worthy of being regarded as a very interesting result of science as applied to modern engineering.

The Albert Bridge appears to possess many new features as compared with existing bridges. For instance, whereas in Chelsea and Hammersmith bridges a girder runs at either side along the entire length of the roadway dividing the carriageway from the footways, and separating the width of the bridge into three comparatively narrow channels in the Albert Bridge, both these are done away with. In most of the suspension-bridges at present erected, also, the roadway, where it passes through the uprights forming the towers, becomes contracted, and afterwards enlarges to its original width again. This, also, is obviated in the Albert Bridge, the roadway of which remains the same right throughout until it enters upon or blends with the approaches at either side, where it assumes their width.

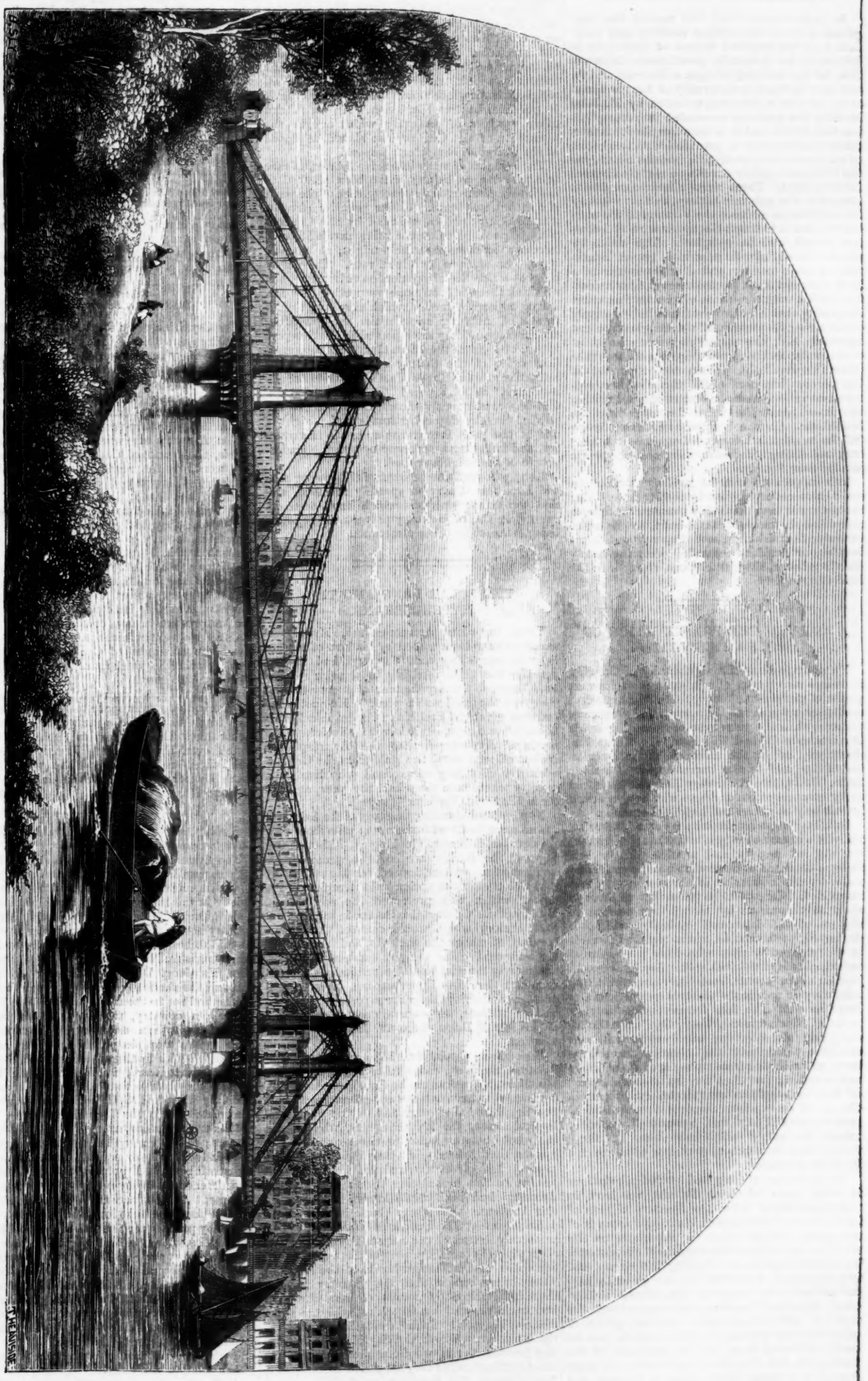
The introduction of this modification of the principle of suspension structures will probably form a new starting-point in some of the wider paths of practical engineering.

It is already introduced on the Continent; a bridge similar in construction to the one from which our illustrations are taken, being likely soon to be commenced over the Moldau at Prague, by the well-known Austrian contractors Messrs. Klein, Brothers.

Fall of a New Pier.—On Sunday last a new pier in course of construction at New Brighton, Cheshire, gave way, and upwards of forty people were precipitated on to the shore. Fortunately the tide was out, and beyond the shock caused by the fall, no person was severely injured.


TRINITY HIGH WATER
LOW WATER
10 5 0 10 20 30 FEET
A
0 5 10 FEET
ELEVATION OF PARAPET GIRDER, &C.
0 5 FEET
PLAN OF A A
A
0 5 10 FEET
LONG.L SECTION OF CARRIAGE ROAD
0 5 10 FEET
LONG.L SECTION OF FOOTPATH
10 5 0 10 20 30 40 50 FEET

ALBERT BRIDGE, ON THE THAMES. DETAILS.



VIEW OF PROPOSED ALBERT BRIDGE, TO CROSS THE THAMES FROM CHELSEA TO BATTERSEA.—Messrs. Ordish & Le Feuvre, Engineers.

A REGULATING THERMOMETER.

A THERMOMETER that will control the temperature of the surrounding medium and maintain it at any required degree of heat must be invaluable for hospitals, greenhouses, laboratories, for the hatching of eggs, silkworms, and for any case in which a uniformity of heat is necessary. A new instrument, invented by M. Jules Maistre, has perfectly succeeded in accomplishing this object, and it is thus described. A mercurial thermometer is provided with two pieces of platinum wire, one dipping into the mercury in the bulb, and another entering a certain distance into the stem. These wires are connected with the poles of a galvanic battery, so that when by the application of heat the dilation of the mercury causes it to touch the upper wire the electric circuit will be complete. The valve by which heated air is admitted to an apartment is made to open and shut by means of a lever attached to an electro-magnet, also in communication with the wires of the thermometer. Supposing that it be required to admit a supply of hot air so as to maintain a temperature not exceeding 86°, the upper platinum wire is let down as far as the given degree and the tube closed hermetically. When the expansion of the mercury has reached 86° the circuit is rendered complete, and the electro-magnet raising the lever shuts the valve for admitting the heated air. On the temperature falling below 86° the current is intercepted again by the mercury retreating, the lever falls, and the valve admits more hot air.

This apparatus can be usefully applied to some cases not mentioned by the inventor. The thermometer may be readily connected with an alarm-bell, or series of alarm-bells, in the event of undue heat taking place, or spontaneous combustion, or accident from fire occurring in any dwelling-house, shop, warehouse, store, or in the hold of a ship.

A NOTE ON THE PRESERVATION OF BRITISH ANTIQUITIES.

To many persons the opportunity of showing to others rare works of art, antique rarities, or places of picturesque beauty, noted for historical and other associations, is a source of even more pleasure than the possession of them. The spirit is commendable, and this good disposition has, doubtless, led to the advance of antiquarian knowledge, and to the improvement of artistic taste. It is, therefore, very desirable to afford every encouragement to those who have a desire in this way to please and benefit the public.

In many instances the keeping up of extensive ruins is a cause not only of considerable expense, but also of anxiety and trouble. There are fitting custodians to be provided, and regulations made for the admission of those who may feel interested. Care must be taken that no damage shall be committed by thoughtless persons to objects of old date and curiosity, which, if destroyed, could not be again replaced; and it is the case with some who have possession of valuable antiquities, that while they have no objection, under certain restrictions, to admit visitors, they do not desire to incur expenses to any large extent. The fees for admission to view parts of Westminster Abbey, St. Paul's Cathedral, and many of our other cathedrals and churches throughout the country, have long been, and still continue to be, a cause of anger and vexation; but then the deans and chapters of the metropolitan cathedrals, and those in charge of some other important ecclesiastical structures, will say that a want of pecuniary means for safely exhibiting those buildings, forces them to resort to a charge of so much a head for admission.

In the course of long and varied pilgrimages in most parts of Great Britain, we have in mansions stored with the choicest objects of interest, met with impediments and sources of annoyance, which were as vexatious to the visitor as we believe the account of them would be to the proprietors. Feeling the wrong and inconvenience of leaving picture galleries and collections in the charge of avaricious, and too often ignorant housekeepers, several of the nobility and others have devised plans of admission by means of tickets, which can be easily obtained from the shopkeepers of the metropolis and the provincial towns. In some instances a charge varying from 1s. is made, and in certain cases the proceeds are devoted to the assistance of some charitable or useful institution.

The main points to be considered in connexion with this subject are, to make scenes of interest as accessible to the public as can be done without interfering too much with the convenience of the proprietors or risking the safety of the treasures which have been collected. In all religious institutions there should, whenever it is possible, be free admission. All ruins and other vestiges of antiquity which are in the possession of the Government should be placed in the charge of competent persons.

The remains of many extensive fabrics, of rare and picturesque beauty, have been allowed to fall into entire wreck in consequence of the want of a little timely care. Under peculiar circumstances this might be afforded by the Government, especially when the ruins have a historic interest. In some cases help might, at a small outlay, be afforded by a local rate. There may be some difference of opinion on this point; but we think there will be none respecting the following malarrangements, which have been a chief means of inducing us to make the preceding observations. They are reported in the Newport paper, and are to the effect that the Assessment Committee of the County of Monmouth have rated the ruins of Raglan Castle, as "a beneficial residence," at 40*l.* a year! The Duke of Beaufort has consequently closed the Castle to the public, thereby depriving tourists of a sight of one of the most interesting scenes in the country, and inflicting a severe loss upon the tradespeople of the neighbourhood.

Many who read the account of this wrong step will hope that it may be speedily retraced, and that the strong opinions which have been expressed on the subject may prevent the example being followed in other directions.

THE POLAR LAND AND THE HYPERBOREANS.

YOUR ingenious correspondent, Mr. Dove' seems to have been misled by his love of mythology in suggesting that the mythical Hyperboreans had their dwelling in a polar sea-girt land, beyond the icy barrier of the north, and "beyond the cold north wind." He quotes the account given in Smith's "Geographical Dictionary," and says,—"It is with allusion to the mythical Hyperborei that the Arimaspi are spoken of, who steal the gold from the Griffins, whatever that may mean, and who live in a country where men sleep half the year, and the air is filled with feathers" [snow].

Now, notwithstanding the story of the Arimaspi has no more to do with the north pole than with the equator, it is worth looking at, although the pages of the *Builder* are hardly appropriate for its discussion; unless, indeed, for the statement that this mysterious nation built temples, in the top of which was preserved the sacred fire. My object in writing this letter is to point out that a theory which would connect the Hyperboreans, of whom the ancients had heard, with the supposed polar sea-girt land, is untenable, and merely fanciful; and to remind your correspondent that the Hyperboreans, the Arimaspians, and the Scythians are represented as contiguous nations, between whom and the people of the Isle of Delos there was frequent communication.

Herodotus (book iv. 13) mentions that Aristeas, the poet, came to a people called the Issedones, beyond whom he found the Arimaspi, a nation who have but one eye; further on were the Gryphins, the guardians of the gold; and beyond these, the Hyperboreans, who possess the whole country quite to the sea. It would appear that Aristeas (if there ever was such a person) had given this account in a fragment known as the Arimaspian Verses, and that the Arimaspi had been made known in Greece by this Aristeas. Elsewhere (book iv. 27) Herodotus says:—"The Issedones" (whom he had previously described as a remote Scythian nation occupying the northern part of the tract now in possession of the Eastern horde of the Kirghis) "themselves affirm that the country beyond them is inhabited by a race of men who have but one eye, and by Gryphins, who are guardians of the gold. Such" (adds Herodotus) "is the information which the Scythians have from the Issedones, and we from the Scythians: in the Scythian tongue they are called Arimaspians, from *Arima*, the Scythian word for *one*, and *spee*, an eye." And (in section 32) he continues: "Of the Hyperboreans, neither the Scythians nor any of the neighbouring people,—the Issedones alone excepted,—have any knowledge."

It is not surprising, therefore, that fables should have been invented about the Arimaspi and the Griffins. "It is affirmed," says Herodotus (book iii. 116), "that the Arimaspi take this gold" (he is speaking of the gold found in the North-west regions of Asia) "away violently from the Gryphins." The same fable is related by Pliny (Nat. Hist., lib. vii., c. 2); and Eschylus says:—

> "Thus the Gryphins,
> Those dumb and ravenous dogs of Jove, avoid
> The Arimaspian troops, whose frowning foreheads
> Glare with one blazing eye: along the banks
> Where Pluto rolls his streams of gold, they rein
> Their foaming steeds."

In many places the sands of the Scythian river Arimaspias are said to have been golden. And the dwellers on its banks are mentioned by Lucan as a people who ornamented their hair with gold.

> "Auroque ligatus
> Substringens Arimaspe comas."

The Gryphins are fabled to be monsters resembling lions, with the wings and beaks of eagles. They appear to have been of Egyptian invention: the Scythians, it is to be remembered, are supposed to have been of Babylonian origin. Possibly the powers of nature with which the Arimaspi had to contend in order to obtain the gold were thus personified.

The Arimaspians were fire-worshippers, and *charis*, the name of their temples, is a suggestive word, as the reader may see in Müller's "Science of Language," vol. ii., p. 371. By the poets of the Veda, the *Harits*, "the bright ones" were fabled to be horses of the sun and the dawn: they had come to be yoked to the car of the dawn. In one passage, they are represented with beautiful wings. In the Greek mythology (which, like Sanskrit, is but another dialect of the common Aryan mythology), the name appears under the form *Charis* and *Charites*, retaining its etymological meaning of the lustrous brightness, or the dawn.

Can the dwellers in the Arimaspias have derived the attribute of Cyclopean monstrosity from wearing in warfare a frontlet or helmet with a golden star?

As to the Hyperboreans, it is well known that the ancients do not appear to have had any precise ideas as to the country they inhabited. According to the Scholiast on Pindar, the Greeks called even the Thracians Boreans: they may well, therefore, have called the people beyond them Hyperboreans. But this is not a fitting place to discuss the subject. W. S. G.

Having shown these observations to Mr. Dove, we append his reply:—

The pith of "W. S. G.'s" very courteous but not very correct letter, lies not in the main body of it, which, as he puts it, is rather irrelevant; but chiefly in the last paragraph, to which, therefore, I shall first advert, by simply asking him what country north of Thrace, short of polar land, could be said to be "beyond boreas or the cold north wind," as is said of that of the true Hyperboreans (Smith's Geog. Dic.), who lived "betwixt the sun and the shade;" where "the sun was said to rise and set to them but once a year" (Lemprière); a country, moreover, which lay *still farther north* than another (the Arimaspian), "where the men sleep half the year, and the air is filled with feathers," and which, therefore, does seem to have, itself, something less to do with the equator than with the pole, notwithstanding what "W. S. G." thinks to the contrary. These ideas as to the Hyperboreans, be it here noted, are not mine, as "W. S. G." incorrectly asserts; and no mere love of mythology could have induced me to suggest them as my own. By quoting them I purposely disclaimed them by inference, and they all the more enforced my argument on that account. They are no other, in fact, than the ideas long and popularly entertained by probably one and all of the best modern authorities, who have had no special theory such as mine to support; and who merely based their idea of the Hyperboreans fairly and unbiassedly on the fragmentary allusions of the ancients,—allusions which induced even the lesser ancients (if I may so call them), such as Virgil, to place the Hyperboreans under the north pole, where the Hindus also placed the "stronghold of the gods," and where alone such a country as is described either could or can exist.

As for those looser expressions of the ancient Greeks whereby they indicated merely unknown

countries to the north of Thrace, I am quite well aware that such expressions were also in use, and they are carefully contradistinguished by the authorities from those which *can* only refer to a *polar* land as the true land of the Hyperboreans. Thus one author (Macbean), after alluding to the Hyperborean mountainous land as being "almost under the pole," goes on to speak of the "Hyperborei, the people the inhabitants of Scythia, *in a looser sense* (Strabo); *and, in a looser still*, those to the north of the Euxine, the Ister, and the Adriatic." Others, such as Lemprière, make a similar distinction.

Without going into the question, therefore, as to what the various ancient writers themselves, either directly or indirectly, did say of the Hyperboreans in a stricter sense, which cannot be properly done in the *Builder*, it is quite clear that such are these various allusions that our modern authorities have been thereby led to place the long-lived Hyperborean men-gods, or perfected men, in a polar land, beyond the cold north wind, with a mild and equable climate, an open sea, and a sun which rose and set to them but once a year;—in short, in just such a land as the polar must be, according to our most advanced modern ideas.

That these Hyperboreans may have had regular communication, through intervening countries, with the sacred and Apollo-bearing Delos, where, as with the Hyperboreans and the "deathless" and Apollo-worshipping Druids, disease and death were (theoretically) unknown, is quite possible, although the latter part of "W. S. G.'s" own quotation from Herodotus is scarcely consistent with that idea; but it *was* said of the Hyperboreans that, "whenever they made offerings, they always sent them towards the south, and the people of Dodona were the first of the Greeks who received them." That a polar people *could* do so was perfectly possible without much navigation, if the warm gulf stream really produces an open sea within the ice-bound stronghold of the arctic region; for that stream, running northwards, and carrying with it the rotary movement of the earth from west to east, into slower regions, naturally and inevitably takes a north-*eastward* course, between Spitzbergen and Nova Zembla; and the same possibility which enables our own vessels now-a-days to carry on traffic occasionally with Archangel, in the White Sea, might enable the Hyperboreans to reach that sea, where the ancient Arimphæi resided; to the east of which were their neighbours the Riphæi of the Ural (gold-bearing) mountains; and from either of whom, to the Issedones of Scythia, or the Balk district, was but a very short journey. To Greece they might have had a much shorter route at one time than this would have been.

What "W. S. G." says, therefore, of the Issedones, even apart from all he says of the more northern Arimaspi, and Griphins, only seems to strengthen the probabilities in favour of the idea that the ancient allusions to the Hyperboreans were not mere mythical fancies, as I myself have said they *might* be.

The Issedones inhabited a district which is believed to have been the most anciently inhabited, by mankind, in all Asia. It lies north of the Hindoo Koosh and the Bolor mountains; the gates, as it were, of the great plateaux of Thibet and of Iran or Persia; and it is from some such source that even the Chinese and the Hindus traditionally trace their origin. Indeed, it was from the fire-worshipping highlanders of Upper Asia that the Aryan and other emigrations of antiquity probably originally emanated.

A little to the north-west of the Issedones were the *Aspisii* mountains of antiquity, and a little farther north were the *Arimphæi* of the White Sea and the Polar Circle, already alluded to: either of these, *or both*, may have been the *Arimaspi* of Hyper-Scythia, "where the men slept half the year, and the air was filled with feathers;" and adjoining both were the *Riphæi* of the Ural mountains, which run north and south like a continuation from Nova Zembla in the Polar Ocean: these *Riphæi* were probably the *Griphins* who guarded *the* (Ural) *gold*, which the Arimaspi stole from them; their leonine and eagle qualifications being perhaps metaphorical; and the name of the *Finns* may be a remnant of the same local name.

Thus even the association of the names of the countries of the Issedones and the more northern Arimaspi and Griffins, with that of the Hyperboreans of the still remoter north, only point all the more distinctly and clearly to the north pole as the true and only possible *Hyper*borean region, to which these other countries south of it were the most direct route of the initiated from the most ancient heart of the old world of civilized humanity, and the shortest and best possible sea route, *viâ* the White Sea and the gulf-stream as it flows north eastward, between Nova Zembla and Spitzbergen.

That even the longer route to the "deathless" Hyperborean men-gods by the gulf-stream *viâ* the British Isles may have also been known at some former time, not only to that "deathless brotherhood," the Druidical "twice-born" men-gods, or godly men, but to kindred continental co-initiates, or co-religionists, who regarded these Apollo-worshipping Druidical magi, as they did the priests of Delos, with great veneration, would seem to be indicated by the ancient idea that the British or Irish Isles also had something to do with the Hyperboreans.

Before concluding, I would wish to remark that from a fuller report than I at first had of the meeting of the Geographical Society at which Dr. Petermann's letter was read, it appears that his present idea can scarcely be identified with mine, inasmuch as he does not propose the arctic voyagers to follow the route of the gulf-stream north-eastward between Spitzbergen and Nova Zembla, but to go at once to the north of Spitzbergen, and hence out of the direct course of that stream, north-eastward.

MASONIC MUSINGS.

THE CRAFTSMEN-ARCHITECTS OF ROME.

"A Roman legion was always accompanied by builders, sculptors, painters, and other artists and workmen, and it has been observed the marks of their footsteps are visible wherever they trod, and that a map of the Roman roads in Britain alone is a magnificent monument of their greatness."

Traced on sculptured frieze and panel,
Testimonies still outstart
Of those minds who grooved a channel
For the record of their art,
Enraptured skill in curve and conic,
In every maze it seem'd at home,
With those grand and old Masonic
Craftsmen-Architects of Rome.

How they plann'd and how they ponder'd,
Are the themes we read to-day;
How they wrought, and where they wander'd,
Which old legion led the way.
In the Doric and Ionic
Column, arch, or duct, or dome,
Live those grand and old Masonic
Craftsmen-Architects of Rome.

First to span with pier and centre,
Drop the keystone, dress the quoin,
Sound and sink, explore and enter
Tunnel, pile, embank, and groin.
Human love of labour chronic,
Forming one great epic poem
Of those grand and great Masonic
Craftsmen-Architects of Rome.

In their contact with the Briton,
Whom they conquer'd, whom they taught,
Much of what is still unwritten,
In each wide domain they wrought;
Genius glowing, souls harmonic,
Exiled artists from their home,
Toil'd those roving old Masonic
Craftsmen-Architects of Rome.

Vandal might and despot malice
Wreak'd their fury all in vain;
Brilliant wreck of shrine and palace
Deck the city still, and plain.
Homes and haunts, and halls baronic,
Archives fill'd with many a tome
Of those glorious old Masonic
Craftsmen-Architects of Rome.

Gone the sunshine, dried the river,
Genius gushes forth in pain;
Man ignores the primal Giver,
Dies atheist in soul and brain:
Gone, those brave and bright laconic
Workmen, to their kindred loam;
Gone, the great and grand Masonic
Craftsmen-Architects of Rome.

Clinton Hoey.

THE PRESIDENCY OF THE INSTITUTE.

Sir,—In the *Builder* of the 8th inst., I observe that you do me the honour to say that I am one of those who have been named in reference to the Presidency of the Institute. As whatever tends to simplify a complication aids in the solution of it, I hasten to assure any member whose friendly feelings may induce him to contemplate nominating me, that my failing strength compels me to forego all hope of that high honour; and that, therefore, a vote in my favour could not possibly be productive of any good result.

Sydney Smirke.

OPENING OF A NEW FERRY AT LIVERPOOL.

The want of a direct ferry between the south end of Liverpool and the Cheshire side of the Mersey has long been felt and complained of, and this cause of complaint has been at last removed, the works having been completed, and the ferry formally opened. On the Liverpool side the permanent structure consists of a floating landing-stage, which measures 120 ft. in length by 30 ft. in breadth, and moored in the river, near the Harrington Dock wall, with which it is connected by a wrought-iron bridge, of 150 ft. in length, and which weighs about 60 tons. The stage, which floats on a wrought-iron pontoon, was constructed by Messrs. Bowdler, Chaffers, & Co., iron shipbuilders, Seacombe. The bridge was made by Messrs. H. Grayson & Son, from designs by and under the superintendence of Mr. D. Hebson, engineer. The pier on the Cheshire side of the Mersey, at New Ferry, has been constructed from the designs of Mr. J. Brunlees, of Westminster, as we have recorded in a former notice of this ferry. The piers now about to be erected at New Brighton and Rhyl are also from designs by the same engineer. The New Ferry Pier commences from the land end with three rows of wrought-iron lattice-girders, 60 ft. in length, and 4 ft. 6 in. in depth, supported by cast-iron columns, 12 in. external diameter, braced with angle irons, the platform, of 4-in. planking, being laid on the bottom flange of the girders. A centre girder divides the whole width of the roadway into two, each of which is 9 ft. wide. The pier proper is 850 ft. in length, consisting of fourteen bays or spans, each 60 ft. in length; at the end of this is a cluster of piles to form a steadying point of attachment for the top of the movable bridge, the end of which is connected with a floating pontoon. The bridge itself is 158 ft. long, and 9 ft. wide. The pontoon forming the landing-stage is 100 ft. long, and 22 ft. wide. This fabric was erected by Messrs. William Galloway & Sons, of Manchester, under the management of Mr. H. Hooper, who, as resident engineer, superintended and carried out the work. The pier and its landing-stage have been erected at the expense of Mr. R. A. Macfie.

THE ARCHITECTURAL ASSOCIATION.

The usual meeting of members was held on Friday evening, the 31st ult., at the House in Conduit-street.

The chair was occupied by the president, Mr. J. H. Christian.

Mr. James Throppe, 4, Stockorchard-terrace, Holloway, and Mr. Thomas Ray, 16, Thayer-street, Manchester-square, were elected members of the Association.

Mr. J. D. Mathews (hon. secretary) announced that it was intended to resume the visits of inspection to interesting metropolitan buildings, and that Mr. Edward Barry had kindly consented to accompany the members over the new Hotel at the South-Eastern Railway Terminus at Charing Cross, which was now so near completion as to admit of full examination. Members were, therefore, requested to assemble on Saturday afternoon, the 8th inst., at three o'clock, in the first-class waiting-room of the railway-station adjoining.

With reference to the paper read on a previous evening, on "Limes and Cements," a wish was expressed, as some of the writer's views were questioned, that he would attend some evening which might be appointed for the discussion of it.

The Chairman said he thought that, in the absence of Mr. Webber, it would not be desirable to discuss any question raised in his paper.

After some conversation, it was arranged that the subject should stand over.

Mr. Mathews directed attention to a communication addressed to the Association on the subject of a memorial to be erected in the City, but with what end was not described. It stated (as we have already mentioned in the *Builder*) that the charity and estates committee of the united parishes of St. Lawrence, Jewry, and St. Mary Magdalen, Milk-street, were desirous of receiving suggestions and proposals, together with drawings and designs or models, for the erection of a memorial in the churchyard on the south side of the Guildhall, at a cost not exceeding 500*l.*, a drinking-fountain to form a feature.

A member inquired what was the object of bringing such a communication under the notice of the Association.

Mr. Mathews said, he had not the most remote idea unless for publicity's sake.

Mr. Blashill said that, in some places, possibly in the City of London, the object and uses of a memorial appeared to be unknown. He had himself spoken to a civic authority on the subject of a proposed memorial which was required, and ventured to ask what it was that was wanted, and all the answer he got was "A memorial—we want a memorial!"

A Member said, he hoped that as a drinking-fountain was to form "a feature" in the proposed memorial, no member of the Association would have the hardihood to suggest another abomination similar to those to be found in the streets of the metropolis, which were absolutely a disgrace to a civilized community. He referred more especially to the iron tea-urns, with threads of intermittent water, a noteable example of which was to be found in the Regent-circus, Oxford-street. These caricatures on street fountains made us the laughing-stock of foreigners.

In reply to questions as to the object of the memorial which the united parishes of St. Lawrence, Jewry, and St. Mary Magdalen, desired to erect, it was suggested that it could not be to the memory of the late City architect (Mr. Bunning), as the corporation were about to "put up something" in the Guildhall, for that purpose. This, however, was subsequently contradicted.

The Chairman said, he regretted to announce that Mr. Wells, who had promised to read a paper "On the Influence of Eastern and Western Art," had been summoned by telegraph to Chatham, and consequently could not be present.

Mr. Paraire then volunteered some remarks upon perspective, which he illustrated with the aid of the drawing-board.

It was announced that the next drawing in the class of design would be an embroidered altar frontal.

THE BUILDING TRADES.

THE Stockport brick-setters' labourers have struck for an advance of wages. They demand an addition of 2s. per week to their present rate, or an advance from 18s. to 20s. per week. It is considered doubtful if the demand will be conceded while the market is so overstocked with unemployed out-door labourers.

A strike of the operative joiners of Blackburn seems to be likely to follow that of the plumbers. A meeting of masters is to be held, to decide what shall be done in the matter.

The masons of Barnsley have struck for an increase of wages and a diminution of working hours. The men state, that some time since they informed their employers that they should require their wages to be raised to 28s. per week, and the working hours reduced from ten to nine per day. The masters not having responded to the notice given, all the works were abandoned by the men.

The dispute at Halifax between the master and operative joiners is yet unsettled. The men seek to have the hours of labour reduced from 57½ hours to 52½ hours per week. The masters have held a meeting, and offered a settlement by the men working 54 hours a week.

At a meeting of the joiners of Newcastle and Gateshead, in order to arrive at some determination respecting the nine-hours movement, which they had asked the masters to concede, about 200 men were present, nearly all the workshops on both sides of the river being represented. A motion was unanimously adopted, to the effect, that if the masters did not concede the terms asked by the men, namely, nine hours per day, they will cease work as soon as the notice expires.

At Carlisle the strike of the bricklayers has terminated by a compromise. The masters withdrew the hour system, which had been the immediate cause of the strike. The men are to receive 26s. a week in summer, and 24s. in winter. Instead of leaving off work at one on Saturday and commencing at seven on Monday, the hours will be twelve o'clock on Saturday and six o'clock on Monday morning. Walking time to be allowed to all jobs outside the city, but within a mile of the Market-cross work is to commence at six a.m. With regard to non-interference, the masters are to employ any bricklayers they may think proper, and the men may work for whom they may think proper; the master to have the power of conducting his own business in any way he may think most advantageous in the matter of letting piecework and in all details of management not interfering with the individual liberty of the men. The masons were offered the same terms, but declined to accept them, and they still remain on strike. The master painters have agreed to give the Saturday half-holiday without change of wages, but will not give the hour asked for on Monday mornings. The men stand out for that hour, which is now all that is in dispute between them. The joiners have reduced the difference to the same question, and some have consented to give the hour,—that is to say, let the men start work at seven o'clock instead of six.

In the Commons, on the motion of Lord Elcho, who moved for Mr. Cobbett, a select committee has been appointed to inquire into the state of the law as regards contracts of service between master and servant, and as to the expediency of amending the same.

COMPETITIONS.

Swansea Infirmary.—A design by Mr. Graham, London, has been selected: the proposed expenditure is 12,000*l.* Tenders are to be applied for: and on obtaining subscriptions to the amount of 6,000*l.*, the works are to be proceeded with.

Chester Town-hall.—The whole affair has come to a standstill for the present; the lowest estimate, without the tower, being 21,600*l.*, instead of 15,000*l.* stipulated, and the town council refusing to go on.

CAST-LEAD TRAPS.

THE importance of good stench-traps and the value of improvements tending to perfect and cheapen them are not to be over-rated. The invention by means of which lead traps may be cast whole, patented by Messrs. Beard & Dent, and advertised by them with diagrams in our pages for some weeks past, deserves immediate attention. Hitherto syphon traps have been made by hand, as it was impossible to cast them on loam cores with profit. They were made by beating up two half-pipes from sheet lead and soldering the edges together with soft solder. Under the new system the cores are formed of gun-metal or of cast iron, according to an invention patented by Mr. Lowe, an American, some four years since; and while, in old times, to make four of these traps occupied a plumber and labourer a whole day, with two sets of the newly-invented cores four men can make eighteen of the 4-inch traps in an hour. The patentees claim:—

"1. That the traps are *considerably* cheaper than hand-made traps.

2. That they are of pure and solid lead, without solder or seam of any kind, and as smooth and clear inside and out as pipe made by hydraulic pressure. And

3. That they are of perfectly regular substance throughout; and, being composed of one metal, are not subject to injurious expansion from hot water, nor are they liable to be affected by the generation of gases which almost invariably destroy the ordinary trap."

As these assertions seem to us perfectly correct, we can scarcely doubt that the new traps will be extensively used.

STONE STAIRS UNDER FIRE.

THE experience of architects and builders in Glasgow with respect to the behaviour of stone stairs there in conflagrations, might be usefully educed in the question (*vide* p. 229) raised by the superintendent of the London Fire-engine establishment. There, while many of the stone staircases entirely project from the buildings to which they appertain, fully as many are comprised within the main walls of the building; yet in no instance have I known any failure at all in the stairs, of the kind referred to. When the combustible parts of a large and substantial structure have been consumed, there along with the walls stands the staircase intact, from the landings of which the ruins can be surveyed, and the levels, for the restoration, be determined. Usually, the staircase is bounded on one side by a main wall of the building; but the other sides, say three in number, are equally fire-proof, consisting either of 9 in. brickwork, or a similar thickness of ashlar stonework, rubbed (or, as they express it, polished) on the side next the stairs, while in the centre is an open well-hole with iron railings or an ashlar newel-wall, which is often not more than 5 in. or 6 in. thick. I think, while about the metropolis the stone used is mostly limestone or oolite, that used in Glasgow is generally sandstone,—a difference which may have much to do with the failure in question.

I hope Glasgowegians and others, accustomed to stone staircases, will throw light on this subject; and that any sudden disposition to discard solid stone as a material for fire-proof stairs may be arrested. JAMES WYLSON.

A FEW WORDS ABOUT WORKING MEN'S CLOTHES.

I VERY much wish that you would allow me to communicate, through the *Builder*, to the world at large, the particulars of a little trick which I have practised for some years with great comfort. I must state that I have as tidy and industrious a wife at home as any man could desire, and it is to her I am indebted for the idea, and the carrying of it out. *I never wear the same suit of clothes, or under-clothing, or boots, two days running.* I am only a working man, engaged in a dirty, foul employment, and the clothes of all my fellow-workmen fairly stink: they call me "the gentleman" because I appear comparatively respectable. Now, I have two clean shirts a week (my whole stock of shirts is four; not of a very grand sort, but they do for me), and I put on one clean shirt on Sunday morning, and one clean one on Monday morning. Then the Sunday one goes on again on Tuesday, Thursday, and Saturday, and the Monday one goes on again on Wednesday and Friday. The days they are left at home my wife looks to them, sees to any tears, &c., which my work has caused: on fine days she hangs them out in the wind, and so on. The same with my stockings and outer clothes. My boots also she dries and tidies up. Before I get home at night from work, she has laid out on my chair, at bedside, all my toggery for next day; and, when I get up in the morning, I have no trouble whatever with my clothes. I give myself a good wash, and start a king! Why, sir, cannot all working men, with wives at home,—I mean men who earn a fair week's wages,—do the same thing whether they are carpenters, or masons, or smiths, or what not? I can assure them that it does not cost me one penny more a year for clothes than it does my mates; indeed, less than some. Any kind of two sets of clothes answers, and the good comes directly. I did not like my wife to have so much trouble with me at first, but she was determined to do it, and I was obliged to give way. She is a good one, sir. God bless her! A WORKING MAN.

DRY ROT.

No remedy is known to perfectly and effectually stop the ravages of dry-rot, although many experiments have been made with more or less success, and made public at various times. Few persons now require telling that the dry-rot is a fungus, known to science as *Merulius lacrymans*. In its mature state the fungus and the surrounding wood frequently drip with moisture, hence its specific name. To be seen in perfection it should be sought for during wet weather, in the autumn, when it is common on the stumps and in the hollow trunks of dying trees. In addition to this form, common on firs, there are nine other species found in this country, nearly allied to it, and sometimes mistaken for it. The dry-rot of oak timber, though bearing the same popular name, is a totally distinct thing.

It must be obvious to all, that with dry-rot prevention is better than cure; for where the timber of a house is reduced to powder, what cure can there be other than cutting the infected wood away, and replacing it with new; but such is the rapid growth of this plant, when once it has found a fitting habitat, that in a couple of years it has been known to utterly destroy a large house, not only reducing the timber to powder, but by insinuating itself between the interstices of the brickwork, and growing through the plaster of the walls, it has so ruined the building as to cause its complete destruction.

However sound the timber may look, or however dry the situation may appear, the *fungus cannot exist without moisture:* unless it can find various favourable conditions necessary for the growth of its seeds or spores, it can never make its appearance; these seeds being microscopic objects, are wafted by the slightest agitation of

the air from one locality to another, and from one end of the land to the other, and just in those places where the conditions are fitting for its growth, will those seeds germinate and produce the dry-rot (this is considering the mycelium, or spawn, or roots are not already in the timber). Experiments have often been tried with wood cut in summer and wood cut in winter, when the sap is down; but although preference has been given to the latter, sapwood of great age is constantly found as free from fungoid growth, and as sound as the very best summer-felled timber: so little or nothing can be said for it.

In open situations, where the air is dry, and where there is plenty of ventilation, the fungus certainly will not grow. This is partly proved by the fact of the dry-rot attacking the timber of one house in a certain neighbourhood, and not appearing elsewhere in the same locality.

If the following precautions be taken, they will reduce the chance of an attack of dry rot to the minimum. In the first place, great care should be taken that the timber used has been felled a reasonable time, and that it is *perfectly dry and dead*. It is of the first importance to have a free circulation of air wherever wood is used, as the disease usually appears where the air is confined and damp. If possible, to more certainly prevent its appearance, a saturation of the timber, before it is used, with creosote, is perhaps the best means, although the various metallic salts have been mentioned as effectual,—a solution of copper, iron, or zinc; of corrosive sublimate; or washing with gas-tar; or the application of albumen. W. G. S.

LESSONS FOR STUDENTS.

There can be no doubt of the great value of the study of details by the student of decorative art, with the power of drawing and modelling, and skill in adapting natural and beautiful forms to ornamental purposes. It is desirable, however, that together with the study of details there should also be afforded the means of inspecting various kinds of work when they are fixed in the right positions and form parts of a whole.

It may be said that the general arrangement of the ornamentation of a building comes within the province of the architect, and not that of the skilled workman. This, to a certain extent, is true; but it must also be acknowledged that in some instances the decorator must act without especial dependence on the architect. It is therefore of consequence, that together with the teaching of the details, the student of architectural decoration* should have lessons of a more comprehensive and general kind; and there are many such to be had within the bounds of the metropolis. Amongst these Somerset House may be mentioned, as a remarkable instance of the elegant application of highly artistic details to parts which are of graceful and good proportions. In this fine building, not only on the exterior, but also in the interior parts, there are decorations of good design and most excellent workmanship. The railings of the staircases, the colouring and gilding of the columns and capitals on the principal landings, the panelling of doors and walls, the foliated brass-work attached to the locks and door-handles, but above all the ceilings of apartments are especially worthy of attention. It is said that the chief part of this work was executed by Italians. During the reigns of Charles II., Queen Anne, William and Mary, and the first and second Georges, there were numerous most elaborate and well-designed ceilings executed by our own countrymen, and it is worth while to notice how very similar the style of the ornamentation of the Somerset House ceilings is to the wood carvings by Grinling Gibbons, and those who in this walk of art succeeded him; and we cannot think that although this appropriate and pleasing style of decoration fell for a number of years almost entirely into disuse, it will fail ere long to be revived in a worthy manner; but it is said that there is a difficulty in obtaining workmen of sufficient skill to compete successfully with the older plaster workers. There is, however, no lack in London of lessons in this style of ornamentation still to be found in the dwellings of the nobility; but especially in some of Sir Christopher Wren's, Gibbs's, and other churches. In the state apartments of St. James's Palace, and in Buckingham Palace, there is much which is worthy of study, with other matters which are in their way useful as instances of what should be avoided.

In connexion with the subject at which we have briefly hinted, it would be desirable that a class for this kind of study should be formed by those of the South Kensington establishment who are engaged in the study of the various branches connected with building and architectural decoration. Then it would become a question how the students could obtain admission into the buildings which it is necessary to see. As regards the churches, Houses of Parliament, &c., there would be no difficulty. Parts of Somerset House, too, are accessible, such as the apartments of the Antiquarian Society. Other portions, occupied as Government offices, are for the most part unoccupied after four o'clock in the afternoon, and on Saturdays at a much earlier hour. St. James's Palace is unused during the chief part of the year, and we should think that, for a purpose such as this, access could be easily obtained to Buckingham Palace. In fact, it would be a great boon to those engaged in all the departments of art decoration, and manufacture, and to the tasteful portion of the public, if, at stated times, certain of the apartments of this royal palace, when it is not occupied by her Majesty, were rendered accessible. In this palace there are rare treasures of art, the study of which would delight and improve many.

An Artist.

* This embraces a wide field, and the labourers in it consist of workers in stone, wood, and various kinds of metal, glass staining, painting, glazing, the making of encaustic floors, plastering, paper designing and hanging, furniture making, gilding, and many other processes.

ABSORBING WELLS.

I have read the letters in your paper on this subject with great interest, and some alarm.

I think the proceedings at New Barnet to be of such a serious nature, that if the system is likely to be carried out in other places, the interference of the Legislature will be necessary to protect the main springs in the Thanet sands from being charged with organic matter.

I agree entirely with the letter signed "Pure Water," and am sure that Mr. Blenkarn is in error when he states that the water arising from the sand stratum under the blue clay is impure.

I have had several artesian wells sunk into this stratum in Essex, and found the water rising from it both softer and purer than that coming from the fissures in the chalk. The Croydon water which rises in the chalk contains not less than 18 grains of carbonate of lime in a gallon; and, although a good anti-cholera water, it coats the vessels in which it is boiled with chalk, and will not agree with many constitutions.

I thought that, after the report of the Committees of the House of Commons in favour of the successful irrigation system carried out under my directions at Croydon, none of these attempts to waste the fertilizing matter contained in the sewer-water would have been repeated, and am sorry that such an influential association as the British Land Company should have allowed such an interference with the main spring.

I know the situation of the absorbing well at New Barnet, and can state that it is within a short distance of the artesian well that supplies that place with water. It will, no doubt, be said that the sand spring is shut out there; but, from my own experience, I can state that this is next to impossible, as the fissures in the chalk below will prevent this being done excepting in the well itself.

With regard to the system of purifying the water in tanks, I need only state that, some years since, the Croydon Local Board, acting under the pressure of an injunction of the Court of Chancery, attempted, with the advice of that eminent chemist, Mr. Way, to cleanse the sewer water there. The matter held in suspension was soon extracted, but the noxious matter held in solution still remained; and I am at a loss to perceive how water loaded with ammonia can be called purified because it has been merely clarified. Nothing but passing the water over growing crops will effect this. I have before me the analysis of the Croydon sewer water taken *before* and *after* it has passed over the irrigation fields; and I am sure that the result will convince the most sceptical that this system is the only effectual mode of cleansing the sewer water.

James Fenton.

*** We quite agree with those of our correspondents who regard the idea of Absorbing Wells with disfavour. In France, special legislation prevents their formation.—Ed.

WINDOW GARDENS.

The idea of "window gardens" is now become general in London, and, as it undoubtedly contributes to the cheerful aspect of the exterior of our dull, dreary-looking houses, and also to the healthy state of the rooms within, it is well to afford every possible facility for this plan. The impediment generally is, want of width of the window-sill on which to place the flower-pots; also want of some protection to prevent the wind from blowing them down into the street. If builders of houses for all classes, whether rich or poor, would make a wide window-cill, with an iron rail, it would be all that is required for a window-garden; and, moreover, it would enable many a poor family to have the benefit of fresh air from an open window without fear of the little children falling out, which is often a reason for not opening the window.

FOREIGN.

St. Nizain.—From its admirable position the town of Saint-Nizain is likely to become the great maritime metropolis of French Transatlantic commerce, as Marseilles is of that of the Mediterranean. Thirty years ago this poor village, at the mouth of the River Loire, contained only 1,200 inhabitants, and few expected that it would in a few years enjoy, as it does now, the position it occupies, with a population of 150,000. In 1858 the Government built in the port a floating basin of 32 acres, the result being, in a few years, a maritime traffic representing half a million tons, without taking into account that of the fleet of Transatlantic packets, now numbering fourteen, and of the united capacity of 27,600 tons, and 8,000 horse power. The insufficiency of this basin was soon manifested, and it was determined to construct a second basin, of 52 acres, now in course of completion. In presence of these works, and the ever-increasing population consequent upon the traffic of the port, a new town is absolutely required, and a company has been formed to carry out the project. Here everything has to be created,—a complete town, with docks, warehouses, depôts, custom-houses, exchange-rooms, chamber of commerce, halls and markets, slaughter-houses, public lavatories, bath establishments, water and gas supply, churches, municipal buildings, schools, theatres, &c. The founders of this society are Messrs. Alph. Cezard, J. Cezard, Ls. Cezard, Count de Loppinot, Colchester, and Thos. Lucassen.

Local Railways.—The French Government is at this moment considering a new project of organization of railways of local interest, constructed at the expense of the departments. This organization will be placed under the direction of the prefects, and annexed to the service of the public highways. Moreover, these local railways can be subventioned by the State, and become assimilated to departmental roads.

Puy.—The town of Puy has just organized two free public courses, one of chemistry and another of literature. In this instance the municipal council has marked the interest with which it regards this step by subventions.

The Russian Epidemic.—M. F. V. Raspail, in a letter addressed to the *Siècle*, thus speaks of the Russian epidemic. This disease bears the general character of the plague which ravaged Marseilles every fifty years, when the port of that town was a vast *cloaca*,—a plague which is in permanence, at certain seasons, in the ports of the Gulf of Mexico—that vast sewer of the Atlantic Ocean, and in permanence even in countries nearer to us, in the barren and wasted steppes of La Campine (Flanders), the depôt of the infiltrations of the Escaut and other channels. In his opinion the pest at St. Petersburg is nothing but a miasmatic affection of the air arising from the putrid emanations of a soil permeable to and soaked with the *immondices* of the city and the mud for years accumulated by the inundations of the Neva and the Baltic. The time at last comes when the organic matter with which the earth is impregnated arrives at such a state of decomposition that the terrestrial elements suffice no longer either to contain them or to preserve the atmosphere from their effects. The remedy for such an evil lies not in drugs: an atmospheric infection requires an atmospheric antidote. To effect this he urges the use of large fires on the public places of the town, and in the large thoroughfares, and even to burn the dead; to fumigate with acetic vapour not only the houses, but the

streets; to cover the infected ground with charcoal, dust, ashes, or chloride of lime; and enjoins all persons to carry a phial of acetate of ammonia, and to frequently inhale it. In order to prevent the return of the calamities, he urges the abolition of cesspools, and the immediate transformation of the refuse of the city into an inoffensive and fertilizing ingredient of cultivation, by the removal of it into the open fields, and by proper treatment there.

PROVINCIAL NEWS.

Pershore.—At the county sessions the court voted 1,700*l.* for the erection of a police-station in this town, and an additional 300*l.* for a magistrates' room, to form part of the same building. It is to be erected at the entrance of the Worcester-road, the work to be commenced at once. The building will consist of two stories, the material being brick, faced with freestone, and will be built from the plans of Mr. Rowe, county architect, the builder being Mr. O. Wilson. In front, there are to be two entrances for the public business, and one for the magistrates; and at each side the superintendent and constable will have an entrance to their dwellings respectively. On the ground-floor are a charge-room, waiting-room, three cells, corridor, residences for the aforesaid officers, with drill-yard, airing-place, stabling, and outbuildings; and in the upper story, a petty sessions room, 28 ft. by 18 ft. 6 in., retiring-room, and six bed-rooms for the officers, &c. The station will be slate-roofed, and the area of the premises is to be surrounded with a dwarf wall and fence.

Wells.—Within the next twelve months, Wells will be considerably improved in appearance by the erection of several new buildings in the outskirts, and re-modelling of others in the city. Of the former, the foundations for the erection of a hotel and several dwelling-houses are now being excavated, the site for them being in an orchard adjoining Prince's-road, and close to the new market-place. Mr. T. Charles, of London, who is the owner of a great deal of house-property in this city, is having the same greatly improved by the introduction of plate-glass fronts, &c. Good houses for the middle and working classes are in great demand and much wanted.

CHURCH-BUILDING NEWS.

Sutton Courtney (*Berks*).—A new porch has recently been erected on the north side of the church in this village, corresponding in style with the original north doorway. It is of Box stone, with red Mansfield stone columns, on which are carved caps. The cost was defrayed by the Rev. H. Rice, rector of the parish, assisted by some few private friends. The architect of the new porch was Mr. J. Gibbs, of Oxford; and the builder Mr. Howse, of Sutton Courtney.

Maxey.—A font has just been placed in Maxey Church. The First Pointed period of Mediæval art has been chosen in designing it. The bowl is of Ketton stone, and supported on a centre shaft of rouge royal marble. There are also four minor shaft supports, executed in Alpine green and white marble. These small shafts have carved capitals of conventional foliage, and the foliage of these capitals is continued round the bowl. The upper and outer rim of the bowl is ornamented with the nail-head ornament. This font is the gift of Mrs. Argles, and was designed by Mr. Browning, of Stamford. The carving and wrought stonework were by Mr. Hilliam, of Stamford; and the marblework by Messrs. Burke, of London.

Burton-on-Trent (*Staffordshire*).—Mr. Bass, M.P., has offered 12,000*l.* to be spent as follows:—5,000*l.* to build a church in the town; 500*l.* for the parsonage; and the remaining 6,500*l.* to be the endowment.

Leckhampton (*Gloucestershire*).—The parishioners, vicar, and churchwardens of Leckhampton are engaged in providing funds for the restoration of their ancient parish church. At a meeting it has been determined to proceed at once with the repairs and enlargement of the structure. The committee state that they intend to provide 200 additional sittings. In all 1,800*l.* will be required.

Sidmouth (*Devon*).—The warming of the parish church has been carried out under the plan of Messrs. Haden, of Trowbridge, at a cost of about 166*l.* The outward air from the roof has been excluded by the closing up of about 3 in. all round, that had been left open by order of the architect, who was employed when the church was repaired and enlarged three years since. At that time another plan of warming was tried by his direction, with a furnace and flues, and underneath the aisles, the heat from which never warmed the church.

Brilley.—The parish church of Brilley, a village about sixteen miles from Hereford, and near Whitney, has been re-opened, after undergoing a renovation. The church was in a sad state of dilapidation. It was decided, however, to restore, and not to rebuild, so as to enable the architect to preserve the peculiar arrangement of the chancel. The restoration work includes the rebuilding of the timber porch after its ancient type, and adapting therein such of the old woodwork as was available. The old windows have been replaced by others of a more modern design, and finished with stone internally as well as externally. The flat ceilings have been removed, opening to view the timber framework of the roof. There are now low open seats, all free and unappropriated. The roof has been covered with green Pembrokeshire slates, and the peaks of the gables finished with stone crests, with metal crosses. The walls have been stripped of the plaster which before covered them, and the joints pointed. The defective drainage of the building has been remedied, and the windows have been glazed with thick cathedral glass, a painted subject being inserted in the east window. There remains one thing to be done, viz., the restoration of the tower, which is of a characteristic type. The plans for the restoration were designed by, and carried out under the supervision of, the diocesan architect, Mr. T. Nicholson, of Hereford.

Wiston (*Pembrokeshire*).—The parish church of Wiston, situated near to Haverfordwest, has been re-opened for Divine service, after having been closed for a year and a half, during which time the old and dilapidated roofs over the nave, chancel, and tower have been replaced with new open timbered roofs; the nave and chancel re-seated; and the stonework of the church internally and externally cleared of whitewash, and restored where practicable. The cost of the works has been defrayed by the Earl of Cawdor, this being the seventh church which has been restored upon his property in Pembrokeshire and Carmarthenshire within the last few years; in addition to which restored churches a new one has been built at Penboyn, in Cardiganshire. The parishioners of Wiston have raised a subscription for the purpose of placing a stained-glass window in the chancel, in memory of the late Earl of Cawdor. The church is one of the usual type of Pembrokeshire churches, with few exceptions, being of an early period, with a characteristic square tower at the western end, diminishing in size from the base upwards. The edifice will accommodate 350 adults and 40 children. The works have been carried out by Mr. James Rogers, builder, of Tenby, from the design of Mr. D. Brandon.

Kimberworth.—The church here has been re-opened. It is in a plain Gothic style, and the original dimensions of the nave were 42 ft. square, with vestries and small recesses for a chancel at the east end. Across the west end was a gallery appropriated to the choir and school children. The improvements that have been effected consist of the removal of the gallery and the erection of a tower 71 ft. high. The nave has thus been lengthened 11 ft., and considerable additional accommodation has been gained. On the one side of the tower is an organ chamber, and on the other side a porch. The cost has been about 400*l.* The architects were Messrs. Blackmoor & Withers; and the builder, Mr. Ripley, Masbro'.

Kilnwick Percy (*Pocklington, Yorkshire*).—The church here is about to be rebuilt, with the exception of the chancel. It is of Norman character, and the restoration will be in that style. It will consist of new nave, 42 ft. by 21½ ft.; north porch, vestry on the south side, and the present chancel, 18 ft. by 15½ ft. The present ornamental porch, in the existing south wall (closed) will be restored and rebuilt into the north porch, and a part of the west doorway will be inserted into the inner door of the porch. The roofs will be open and varnished, boarded and felted, and covered with slate. The windows are to be filled with stained and cathedral glass. The nave will be entirely refitted with open seats, and those in the chancel, as well as the pulpit and desk, will be reinstated and re-formed out of the oak carving, which was previously in the church. The entire work is being carried out at the expense of the Hon. Admiral Duncombe, M.P., of Kilnwick Percy, from designs prepared by Messrs. J. B. & Wm. Atkinson, of York, architects; and the works are being executed by Mr. Ald. Weatherley, of York.

Pickering (*Yorkshire*).—The church of Thornton is to be restored. The chancel will be renewed, the old pewing removed, and new seats substituted, and the whole of the interior will be renovated. Several memorial windows will be put up, viz.,—one at the east end, in memory of the late Mr. R. Hill, of Thornton; at the west end, in memory of the late Mr. Champley, of Scarborough; and another in memory of the late Mrs. Heslop, wife of the present rector. The exterior will also be improved by a new roof, and the probable addition of a spire to the present steeple, as well as the repair of the whole of the exterior fabric. The whole work, with the exception of the spire, is computed to cost about 1,200*l.*, and of this sum upwards of 900*l.* have already been subscribed. Mr. Scott has been employed in the work, which will be commenced forthwith.

Rotherham.—A font has just been placed in the parish church of All Saints, Rotherham, the gift of Mr. John Shaw, of this town, architect. It is in the Perpendicular style, and in a great measure a *fac-simile* of the old font, copied from an old sketch of it in the possession of the donor.

STAINED GLASS.

Thatcham Church.—A new memorial window has been placed in the west end of the south aisle of Thatcham Church, by the vicar and his family, in memory of some of their deceased relatives. The glass is by Powell, of London. The subject is that of the Nativity, exhibited in three compartments. The centre one contains the figures of the Virgin Mary, with the infant Jesus, attended by St. Joseph and adoring angels. In the compartments on either side are the Shepherds and the kingly Magi, in the act of worshipping; while the beams from the Star in the East, falling alike on the Divine infant and His worshippers, give unity to the subject.

Hope Church, Hanley.—A memorial window to the late Rev. J. Eastwood, incumbent, has been placed in this church. The window consists of two medallion groups on a foliage ground and border, representing the Walk to Emmaus, and our Lord making himself known by the Breaking of Bread. One window has been executed by Mr. Wailes, of Newcastle.

Gloucester.—Three painted glass windows have lately been erected in this city, according to the local *Chronicle*,—two at the cathedral, and a third in St. Mark's Church; a memorial window to Dean Rice has been placed in the east cloister of the cathedral; and the large memorial windows to Dr. Jenner and the late Mr. John Elliott, of Gloucester, will probably be erected in the course of a few weeks. Mrs. Claxson, widow of the late Rev. Dr. Claxson, is about to place a memorial window in the cathedral to Hooper, the martyred bishop of Gloucester. Messrs. Clayton & Bell were engaged, and the artist under whose direction the window has been executed is Mr. Kemp, a nephew of Mrs. Claxson. The window selected for the reception of the glass is the third from the east entrance to the cloisters in the north aisle. The window is a Norman one, and the introduction of Perpendicular tracery renders the carrying out of any broad design difficult, if not impossible. The mullions divide the main portion of the window into three lights, and the semicircular part into two lights, and there are two smaller side lights. The subject represented in the first light is the torture of St. John the Evangelist in the cauldron of boiling oil at Rome,—an ordeal through which we are told he passed unhurt. The subject in the centre is the martyrdom of Bishop Hooper. The subject of the third light is the martyrdom of St. Lawrence, who was roasted to death on a gridiron. There are canopies over the figures. The window is inscribed in memory of Richard Hooper, sometime Bishop of Gloucester and Worcester. The bishop's name was John, not Richard; and he is represented in Romanist vestments, which is scarcely consistent with his own aversion to the ceremonial religion of Rome. The second window is a memorial to Archdeacon Wetherell, and is placed in the east cloister. The artist was Hardman, of Birmingham. The window is divided into four tiers, the two lower ones each containing eight lights, the third four, with two main lights in the top. The subject

selected is "The Temptation of Our Lord," which is depicted in the second tier, the lower spaces being filled with decorated quarries. Each space is occupied by one figure, and, of course, two lights are devoted to the representation of each incident. The tracery lights are decorated with foliage, of the German Gothic leaf; and the main pictures are represented on an enriched blue ground, which affords a contrast to the window to Dean Luxmore, which is next to it. The colouring of this is necessarily light, and the subject is rather meagre, the artist being confined to two figures, but the incidents are clearly delineated. A stained glass window has been put up in the east end of the south chancel aisle of St. Mark's Church, by Mr. A. C. Wheeler, of Kingsholm, to the memory of his father. The window is a double lancet, with a quatrefoil over. The general plan of the subject refers to the infant life of the Saviour and his treatment of children. The artists were Messrs. Heaton, Butler, & Bayne, of London. With the exception of the east window at St. Aldate's Church, this is the only specimen of their art in Gloucester.

St. Peter's, Newcastle.—A stained-glass window has just been placed in the chancel of St. Peter's Church, Newcastle, to the memory of the late Captain Woods, by his widow and daughter. The subject introduced is that of "The Good Centurion." The window was executed by Messrs. Herdman, of Birmingham.

Miscellanea.

National Gallery.—It is understood that the Government plan for enlarging the National Gallery will be presented to Parliament after the recess.

Proposed New Exchange for Manchester. It is now suggested to carry the Exchange, like the Post-office, to Brown-street, and the plot selected is one bounded by that street on one side, by Spring Gardens on the other, and running back from King-street to the Clarence Hotel. The plot can be obtained without an Act of Parliament, and is said to afford space for a building double the size of the present Exchange, and one-third larger than that the Exchange Committee propose to build. It contains 4,280 yards of available building land after allowing nearly 1,000 yards for street improvements. The estimated cost of land and buildings is 200,000*l.* and it is calculated that a net revenue of 20,000*l.* might be obtained from subscribers. The party for this scheme is a very influential one.

Memorial of the late Duke of Northumberland.—A public meeting has been held at Newcastle-upon-Tyne for the purpose of opening a subscription to provide funds for erecting at the sea-side, in the county of Northumberland, a suitable building, to be called "The Prudhoe Convalescent Home," for discharged or convalescent infirmary patients, and others, "as a memorial of the admiration in which the memory of the late Duke of Northumberland is held by all classes of his countrymen." The meeting was under the presidency of the Mayor of Newcastle, and was attended by most of the leading gentry of the town and neighbourhood. The company included a large number of ladies. Appropriate resolutions were passed, a subscription-list opened, and a committee appointed. Sir William Armstrong subscribes 1,000*l.*, and Mr. Hugh Taylor 500*l.* The subscriptions at the close of the meeting amounted to 3,011*l.*

Magnesium and its Light.—A Putney correspondent, "William White," who states that he has made many experiments with magnesium, says, in a communication to us on the subject,—"In suggesting that the wire should be passed through a spirit flame, you indicate an efficient remedy for the annoyance. A lamp in which the wire was so treated was devised by Mr. William Mather, of the Salford Iron Works. The wire was paid out by hand from a roller, and passed through the flame of a spirit-lamp, and so ran no risk of extinction. I find the ribbon burns with greater certainty, as well as brilliance, than the wire. The wholesale price of magnesium wire and ribbon has been reduced one half, or to 10s. an ounce. There are about 180 ft. of wire or ribbon to the ounce, and so, I calculate, it will be retailed in the shops at 1d. a foot. I find the ribbon burns at the rate of a foot a minute, so one might have a magnesium illumination for two hours at the cost of 10s."

Fall of Floors.—Four floors in a wall corner of the corn-mills in the occupation of Messrs. James Ellis & Co., Bradford, suddenly fell, precipitating about 192 sacks of flour, about 200 quarters of wheat, and several workmen, to the ground floor. The accident arose from the giving way in the third story of a brick wall, on which rested an iron pillar which supported the three floors above. A joiner was rather severely bruised.

The Fittings for the West London Exhibition.—Tenders have been obtained for the erection of counter space in the Floral Hall, Covent Garden, for the West London Industrial Exhibition at per superficial foot. The following is a list:—Mr. Tackley, 9d. per ft.; Mr. French, 6¼d. per ft.; Mr. Warwick, 6d. per ft.; Mr. Bradbeer, 5½ per ft.; Mr. Carpenter, 3½d. per ft.; Mr. W. H. Thompson, 3d. per ft.; and the last has been accepted. Mr. S. S. Brown is the architect.

The Landed Estates Company. — By the Report read at the first annual meeting of this company, it appeared that 31,743*l.* had been received in respect of allotted shares, while the gross profit on the year's transactions equalled 12,856*l.* 13s. 4d. After payment of all outgoings the net profit amounted to 11,301*l.* 6s. 6d., which would enable the directors, after declaring a dividend of 15 per cent., to carry forward over 10,000*l.* The first estate the company had purchased was the Worcester Park Estate, near Kingston and Ewell. The company had nothing to do with bricks and mortar, further than assisting builders in the erection of first-class houses upon the estate, which comprised about 300 acres, and from the sale of 64 acres only, a profit of more than 11,000*l.* had been realised, after deducting the expenses of roads, sewers, &c.

Statue of the Premier.—At Lady Palmerston's receptions the model of an intended marble statue of the Prime Minister has excited attention. This statue, about to be executed by Cavaliere Giovanni Pandiani, of Milan, is the third of a series which he is engaged upon, and which are to form the nucleus of a collection of European celebrities for Mr. Ernesto Zuccani, a gentleman of considerable mercantile standing long resident in London. The first of these statues, a life-size one of Garibaldi, appeared in the Exhibition of 1862. For the second one, that of the late Count Cavour, Signor Pandiani received the honour of knighthood from the King of Italy.

Gas Lighting of Moscow.—We announced on the 17th of December last, that a Hague gentleman had got a concession from the Russian Government for lighting Moscow with gas. This concession, we now learn, has been assigned to a new limited company, to be called "The City of Moscow Gas Company," among the directors of which are some substantially good names. The capital will be 875,000*l.*, in 35,000 shares of 25*l.* each. Deposit, 1*l.* on application, and 4*l.* on allotment; 7 per cent. per annum allowed during construction. Moscow is a great city, with 17,032 shops, 700 factories, &c., 200 hotels, 4,841 inns, cafés, &c., and numerous universities, schools, hospitals, public offices, and buildings devoted to public amusement. It is, in fact, the winter capital of Russia, and an exclusive right to supply such a city with gas ought to be a fine thing for the shareholders. The population is about 500,000. The city is situated at the centre of the commerce of the country, with six railways converging within its walls. The Kremlin (which covers 250 acres, and includes the Emperor's Palace, the Senate, the Arsenal and Government Offices), the great Universities, and the public schools, will all have to be lighted by gas. There are upwards of 100 police posts and stations, and 102 printing-offices. The Government pays annually 13,600*l.* for the lighting of the Opera House and the Russian Theatre alone, and 12,000*l.* for the Barracks. Private houses also will, doubtless, be lighted with gas. A provisional contract has been entered into with Smith, Knight, & Co. for works capable of supplying 120,000 lights, together with the whole of the mains of the city (upwards of 140 miles in length). The net profits upon the capital required for this purpose are calculated to exceed 20 per cent. per annum, and in this estimate no profit is assumed on the public lights. Sufficient plant will be erected for the supply of 50,000 lights, by the end of August in next year. We are not surprised to hear that the chief part of the capital is already subscribed.

Non-absorbent Bricks.—With reference to the inquiry after non-absorbent bricks noted in your last, I think the perforated bricks that come up by the Great Northern Railway from Arlsey are as nearly non-absorbent as any material I know of which is obtainable at a moderate price. They make a good, clean, uniform face, though rather pale; but they stand well. The only drawbacks I have found to their use are, that cutting them is almost impossible, and that they generally run larger than ordinary bricks; so that a little extra care is needed where they are used along with others to keep the mortar-joints of the facing very fine.—R. S.

Metropolitan Open Spaces.—The first report of the select committee appointed to inquire into the best means of preserving for the public use the forests, commons, and open spaces in and around the metropolis, have made progress in the matters referred to them, and have agreed—"That it is not expedient that the Wimbledon Common should be fenced round or enclosed, or that the existing common rights should be extinguished. That it is not necessary, and would be undesirable, that any part of the common should be sold. That the 20 Hen. 3, c. 4, commonly called the Statute of Merton, by which a lord of the manor can enclose without either the assent of the commoners or the sanction of Parliament, ought immediately to be repealed."

The Displacement of the London Poor.—In the House of Lords, last week, the Lord Chancellor stated that to insure the return of the actual dwellers of the houses to be taken for demolition he proposed an amendment in the Standing Order No. 191, of the words "inhabited by the labouring classes," to "occupied either altogether or partly as tenants or lodgers by persons belonging to the labouring classes;" and that another alteration should be made rendering it obligatory on companies to give notice, by placards and handbills exhibited in the vicinity, of the houses about to be pulled down, the certificate of a magistrate being made necessary to show that the order had been complied with. The Order, thus amended, was then agreed to.

Inauguration of a Gymnasium at Edinburgh.—The new Royal Gymnasium, in connexion with Pitt-street swimming-baths, has been publicly inaugurated in presence of the Lord Provost, magistrates, and town council of Edinburgh. The new gymnasium has been constructed at the expense and under the immediate supervision of Mr. John Cox, Gorgie House. The patent rotatory "boat" is one of its features. This "boat," in the form of a circle, is 471 ft. in circumference, and 6 ft. wide. It is placed in a large circular artificial pond, and is designed to rotate with rapid motion when the means of propulsion are applied. To preserve it in an undeviating course, and prevent it coming into collision with the sides of the pond, it is stayed with wire ropes, which are attached to an iron pivot fixed in the centre of the water. It is like a merry-go-round rotating in a pond. The boat is constructed to carry 600 "passengers," and when unladen draws 4 in. of water. The guests got into the rotatory boat, and had a sail round the artificial pond, Miss Cox having christened it, oddly, the "Great Sea Serpent." The next invention tested was the "Merry-go-round" itself, in which a large number of the guests took seats, and, to all appearance, they enjoyed the sport.

Railway Bridges over Streets.—The London, Chatham, and Dover Railway Company have been charged, at the home circuit assizes, with a nuisance, by contravening their Act in the mode of building their Newington bridges, thereby endangering the public safety. The company pleaded not guilty to the indictment. The local vestry were the prosecutors, in the name of the Queen. It was argued on their part that the bridges complained of were not water-tight, and from want of deadening arrangements the noise of trains passing startled horses, so that accidents had happened and lives were lost. In other and similar bridges these defects had been obviated with the greatest ease, and the defendants were bound to do all in their power to prevent their bridges being a public nuisance. They were not asked to destroy the bridges, but simply to alter or improve them a little. The Lord Chief Baron, at the close of the prosecutors' case, suggested that the matter should be referred to some competent person to examine the bridges, and decide what should be done; and this was finally agreed to, the defendants to pay the costs of the suit, if found in the wrong.

SUBSTITUTE FOR BLASTING POWDER. — At Stockholm several experiments have been made with nitro-glycerine, in order to test its application as a substitute for blasting powder in mining operations. They were considered very successful, the new compound being found to be superior in its effects to the ancient method, and the price considerably less. Among other trials, a hole bored near the summit of a rock to a depth of 23 ft., was charged with 5½ lb. of nitro-glycerine. Five minutes after the fuze had been lighted a dull report was heard, and enormous blocks were detached from the rock. Several other mines were fired with blasting powder, but their effects were inferior to those of the nitro-glycerine.

"SUSPENDED BETWEEN HEAVEN AND EARTH, LIKE MAHOMET'S COFFIN."—There is a good deal of "see-saw" in Science. First it is pointed out that the idea of Mahomet's Coffin, suspended between heaven and earth, is a strictly scientific one, which indicates a possible effect of magnetism. Then it is proved that such a suspension is not scientifically possible. Then again, we find Prof. Tyndall, in one of his recent lectures "On Electricity," at the Royal Institution, showing the idea to be, after all, a strictly scientific one. A piece of gold leaf, 2½ in. long and 1¼ in. wide, is cut into the form of a kite or fish, placed on a piece of paper, and presented to the knob of a large Leyden jar charged with electricity. When detached by a knife, the leaf springs towards the knob, but stops within 2 in., and remains hovering in the air, the tail waving like that of a fish. When the jar is moved, the gold leaf follows, and continues to float for nearly an hour. The experiment may be made with a smaller jar and with smaller pieces of gold leaf.

IRISH RAILWAYS.—In the House of Commons, last week, Mr. Monsell moved that an address be presented to her Majesty, praying that the commissioners appointed to inquire into the railway system of the United Kingdom may be instructed to direct their inquiries, in the first instance, to the Irish railway system, with a view of ascertaining such facts as may enable the House to determine whether the provisions of the second clause of the General Railway Act of 1844 should be applied to such Irish railways as are subject to its provisions. He contended that the application of the Act of 1844, by which the Government would take possession of the railways of Ireland, would immediately benefit that country and stimulate industry and enterprise. Mr. Whiteside supported the motion. If the motion were carried, he said, it would be regarded in Ireland as a proof of the kindly feeling of the House. Mr. Scully also strongly supported the proposition. Mr. Ennis thought the Chancellor of the Exchequer would be an exceedingly bold man if he attempted to carry out the change proposed. There could be no doubt that railways in Ireland were at present comparatively failures; but that arose from the wretched condition of the country. The Chancellor of the Exchequer said he could give the assurance that measures should be taken to ensure the fullest investigation into the affairs of Irish railways. If it were desired to confer any special boon on Ireland, he did not believe there was any method so comprehensive as the Government taking the railways into their control, with a view to the reduction of the fares; but he could not pledge himself to what would be done by the Government in the matter at some future time. Mr. Monsell then withdrew his motion.

TENDERS

For alterations to the rifle range, for the Norwich Volunter Rifle Corps. Mr. James S. Benest, architect:—
Newman & Bussey (accepted) ... £107 5 0

For rebuilding a house, in Lawrence-street, Chelsea, for Mr. Auguste Smith. Mr. Charles Bowes, architect:—

Fish	£650 0 0
Pitts	556 0 0
Godbold (accepted)	472 10 0

Accepted for new national school, Mexbro', exclusive of fittings. Messrs. Blackmoor & Wither, architects:—

Mason's Work.

Harper	£258 0 0

Carpenter and Joiner's Work.

Pearson	145 0 0

Plasterer's Work.

Bendelow	31 0 0

Plumber and Glazier's Work.

Hirst	45 0 0

Slater's Work.

Kemp	78 0 0

Painter's Work.

Briggs	14 0 0

Accepted, for school, at Brightside, near Sheffield. Mr. C. J. Innocent, architect. Quantities supplied:—

Greenwood (mason)	£400 0 0
Bradbury (joiner)	320 9 0
Staniforth (slater)	42 12 0
Harrison & Chadwick (plasterers)	29 15 0
Seale (plumber and glazier)	105 10 0
Langton (painter)	8 0 0

For coffer dam and river wall, Norwich. Mr. James S. Benest, architect:—

Coe & Hobrugh	£148 6 0
Spinks	148 0 0
Hobrugh & Moore	130 0 0
Balls (accepted)	125 0 0

For the enlargement of Christ Church, Milton. Mr. S. Parr, architect:—

Shadgate	£533 0 0
Gould	505 0 0
Stump	500 0 0
Cobham	477 14 9
Lillystone	472 0 0
Blake (accepted)	447 0 0

For a house, in the Upper Richmond-road, Putney, for Mr. Hewett. Mr. Livock, architect. Quantities supplied by Mr. Pain:—

Colls & Son	£1,145 0 0
Jennings	1,145 0 0
Sharpington & Cole	1,083 0 0
Howard	1,045 0 0
Aviss & Son	1,022 0 0
Adamson & Sons	985 0 0

For the erection of a new chapel, at Beeston, in Bedfordshire:—

Williams	£595 13 4
Joy	499 0 0
Field	480 0 0
Dainham (accepted)	475 0 0

For alterations, 309, Camberwell-road, for Mr. R. Knight. Credit allowed for old materials. Mr. John Scott, architect. Quantities supplied by Mr. C. W. Eppy:—

Acock & Son	£370 0 0
Westrop	340 10 0
Cosser, Brothers	305 0 0
Humphries, Brothers	250 0 0
Ring & Wainman	239 0 0

TO CORRESPONDENTS.

A. G. J.—C. F.—J. W.—E. T.—S. & W.—S. D. W.—Mr. G.—A Reader.—A Justice.—G. W. J.—J. D. P.—J. W.—H.—J. R.—T. R. S.—H. P. H.—G. E.—W. W. (in type).—O. & Le F.—M. S. S. (shall be looked to).—A. P. X. (premium depends entirely on the office selected and the capability of the youth).—H. H. S. (shall see a proof).—W. R. C. (in type).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender; not necessarily for publication.

Advertisements cannot be received for the current week's issue later than **FIVE o'clock, p.m.,** *on Thursday.*

NOTE.—*The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.*

[ADVERTISEMENT.]

CHURCH, TURRET, and STABLE CLOCKS. J. W. BENSON, having erected steam-power and improved machinery for clock-making, at the manufactory, Ludgate-hill, will be glad to furnish to clergymen, architects, and committees, Estimates and Specifications of every description of Horological Machine, especially cathedral and public clocks, chiming tunes on any number of bells. A descriptive pamphlet on Church Clocks post free for one stamp. Watch and Clock Maker by Warrant of Appointment to H.R.H. the Prince of Wales, and maker of the great clock for the Exhibition, 1862. 33 & 34, Ludgate-hill, E.C. Established 1749.

ADVERTISEMENTS.

CITY PROPERTY.—First-class Investment in King William-street.

MESSRS. BEADEL are instructed to SELL by AUCTION, at the GUILDHALL HOTEL, Gresham-street, on WEDNESDAY, the 19th APRIL next (unless previously disposed of by Private Contract), the commanding PREMISES, known as No. 49, King William-street, held on lease for a term of 80 years from Michaelmas, 1832, at the moderate ground rent of 84l. per annum. It possesses a frontage of 18 feet, with an average depth of 45 feet, and contains about 810 square feet. In the basement are convenient domestic offices. On the ground floor, elegant shop with private room in the rear; also an office which, with the first and upper floors of the house, is approached by a separate entrance from the street. The one, two, and three pair floors are used as offices, and on the roof, forming a fourth floor, is a large photographic establishment. The whole is sub-let to Mr. Henderson for 14 years from Midsummer, 1862, at 250l. the lease being determinable by the vendor at Midsummer, 1869, thus enabling a purchaser to obtain early possession of these important premises, which, from their situation, are capable of producing a return of at least 500l. per annum.—Further particulars will shortly be published, and may in the meantime be obtained of Messrs. CREE & LAST, Solicitors, 13, Gray's-inn-square, W.C.; Messrs. NEWBY, RICHMOND, & WATSON, Solicitors, Stockton-on-Tees; and of Messrs. BEADEL, 25, Gresham-street, E.C.

TO CONTRACTORS, BUILDERS, and OTHERS. — IMPORTANT SALE of RAILWAY PLANT.—TO BE SOLD by Public AUCTION, on MONDAY, the 24th day of APRIL next, and following days, the whole of the remaining extensive PLANT employed in the construction of the Cockermouth, Keswick, and Penrith Railway, consisting of Contractors' Tank and other Locomotive Engines; a large number of earth waggons, yard waggons, dobbin carts, quarry and derrick cranes, planks, barrows, viaduct centring and battens, and temporary sleepers, bolts, chains, blocks, tools, &c.—Printed descriptive Catalogues will be ready seven days prior to the day of Sale, and may be had gratis on application to the Auctioneer, Mr. JOHN JACKSON, Penrith; or at the Offices of Messrs. GEORGE BOULTON & SON, in Penrith, Keswick, or Cockermouth.

To Timber Merchants and Government Contractors.—Extensive Sale of Large Navy Oak, with lop, top, and bark; also Larch and Spruce Fir Timber, standing on the Kirby Estate, Inkpen, and on the Maiden Court Estate, East Garston, Berks.

MESSRS. ALEX. DAVIS & T. PALMER are honoured with instructions from Captain Butler, to SELL by AUCTION, at the CHEQUERS HOTEL, Speenhamland, Newbury, on TUESDAY, APRIL 25th, 1865, at TWO o'clock in the Afternoon, 770 NOBLE OAKS, standing on the various lands and coppices on the Kirby Estate, with 230 extremely fine Larch and 120 fine Spruce Firs; also 574 NAVY OAKS, standing on Maiden Court Farm, East Garston. The above timber is adjacent to good roads. That at Kirby being near the Kintbury Wharf and Station, most convenient for water or railway carriage. The Auctioneers beg to call attention of Government contractors, ship builders, and timber merchants, to the above Sale, the timber being of large navy metings, of superior quality, and is admirably adapted for Government and shipping purposes.—Catalogues, with full particulars, reservations, and conditions of sale, may be had one week prior to the sale, of the Gardener at Kirby House, and JAMES GREEN, East Garston, Berks (who will show the lots); by post on application, of Messrs. DAVIS & PALMER, Auctioneers, Valuers, Land and Timber Surveyors, and Estate Agents, Market Place, Newbury, Berks.

To Paper-stainers, Decorators, Builders, and Others.

MR. J. HONISS has been favoured with instructions from the Inspectors in the Estate of Mr. John Catto, of 50, Upper Thames-street, to SELL by PUBLIC AUCTION, on the PREMISES, on TUESDAY, APRIL 18, and following days, at TWELVE for HALF-PAST TWELVE precisely, the whole of the elegant and well assorted stock of French and English PAPER-HANGINGS: comprising upwards of 15,000 pieces of French papers, borders, and decorations, from the first manufacturers in Paris; and over 35,000 pieces of English papers, borders, &c. of all descriptions; also, the whole of the printing blocks, rollers, and designs, a great number of which are quite new; and all the useful and valuable FIXTURES, FURNITURE, &c.: comprising three powerful cranes, with jib heads, chains, &c. complete; weighing, flatting, grounding, and a metal protecting machine; the valuable show screens of decorations, eight large mahogany desks, letter-copying press, writing-tables, with nests of drawers, &c. complete, suitable for first-class merchants' offices; oak and mahogany top counters, racks, gas-fittings, several thousand feet of 1-in. and 1½-in. shelving, a four-wheel covered van, good as new; capital set of plated harness, a strong truck, two packing machines, carpets, oil-cloths, chairs, warehouse clock, &c. &c. About 100 dozen first-class champagne.—May be viewed on Saturday and Monday prior to Sale, when catalogues may be had on the Premises.

GRAY'S INN ROAD.—To Builders, Cabinet Makers, Pianoforte Makers, and Others.—Absolute Sale of a well-seasoned Stock of Timber.

MR. H. STANTON will SELL by AUCTION, on the PREMISES, in the rear of Nos. 2 to 12, Gough-street, Mount-pleasant, Gray's-inn-road, on WEDNESDAY APRIL 19th, 1865, and following day, at ONE o'clock to the minute each day, on account of the number of lots,—

50,000 Dry Prepared Flooring Boards,
7,000 Yellow and White Planks and Deals,
10,000 Feet of Yellow and White Scantling,
5,000 Feet of dry Honduras Mahogany,
Dantzic Timber, Oak, Ash, Beech, Laths, &c.

May be viewed the day previous and morning of sale, and catalogues had on the Premises, and at the Auctioneer's Offices, 9, Amwell-street, Pentonville.

Third Sale of Surplus Lands, the property of the London, Chatham and Dover Railway Company, close to the Blackfriars Station.—The Directors of the London, Chatham, and Dover Railway Company have instructed

MR. VIGERS to prepare for SALE by AUCTION, at an early date (unless an acceptable offer shall be made by private treaty), THREE valuable SITES of FREEHOLD LAND, forming a total area of about 31,400 feet. The most important plot is situate at the corner of Southwark-street and the Blackfriars-road, with frontages and lights on all sides, and measuring about 21,800 feet; the other plots are situate, one in Charlotte street, Blackfriars-road, comprising about 6,600 feet, the other in Robert-street, Union-place, Blackfriars-road, comprising about 3,000 feet.—Particulars may be obtained of Messrs. FREEHFIELDS & NEWMAN, 5, Bank-buildings; at Garraway's Coffee-house; the Estate Exchange; and of Mr. VIGERS, 3, Frederick's-place, Old Jewry,

TO ARCHITECTS, ARCHÆOLOGISTS, and ANTIQUARIES.—Messrs. COX & WYMAN, Printers of "The Builder," having had great experience in the production of every variety of Work relating to Architecture, Topography, and the Fine Arts, their Establishment affords superior facilities for the execution of the above description of PRINTING, whether illustrated or otherwise, in the best possible manner and at moderate prices.—COX & WYMAN, Fine Art and Classical Printers, 74 75, Great Queen-street, London, W.C.

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